*JOURNAL OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS*

THIRD SERIES

VOL. 42 No. 20 12 OCTOBER 1935

## CONTENTS FOR 12 OCTOBER 1935

JAMES ELMES, 1782–1862

Recently presented to the R.I.B.A. by Miss Alice Francis, granddaughter of James Elmes

Painted, about 1820, by Lonsdale, Elmes's intimate friend and godfather of his son Harvey Lonsdale Elmes

Elmes was one of the most famous architect-antiquaries of his time and the author of many important books, among which are *Memoirs of Sir Christopher Wren*; an annotated edition of the *Parentalia*; *Metropolitan Improvements or London in the XIXth Century*, illustrated by Thomas Hosmer Shepherd; *A Topographical Dictionary of London and its Environs*; *A Dictionary of the Fine Arts*, and a work on Dilapidations

JOURNAL OF THE
ROYAL INSTITUTE *of* BRITISH ARCHITECTS

VOL. 42. 3RD SERIES 12 OCTOBER 1935 No. 20

# Journal

It is with great regret that we record the death of Sir Walter Tapper, K.C.V.O., R.A., F.S.A., and Past President of the R.I.B.A. His honours, several of which came happily and appropriately to crown his active and fruitful career represent the esteem with which he was held by his contemporaries and which is properly reflected in the memoirs by Mr. Guy Dawber and the Dean of Westminster which appear elsewhere in this number of the JOURNAL. The persistent continuance of the Gothic revival in these days is due chiefly to the existence of architects who, like Tapper, backed by learning and experience of the historical style have been able to bring their architecture into tune with the realities of modern conditions without surrendering a jot of their genuine faith in the validity of Gothic stylism. This is most clearly seen in the Church of the Annunciation, Old Quebec Street, generally considered to be his masterpiece, and in a later building, St. Erkenwald's Church, Southend. They are virile and completely devoid of the flaccid ingenuousness that such work can have in the hands of a less expert designer. Partly because they have the right measure of traditionalism these churches, and almost all Tapper's ecclesiastical works, seem to be built round a tradition of religious observance and properly to enshrine it, and are not (again the comparision may seem unfavourable to some modern work) buildings expressing primarily the architect's ideas to which religious observance must conform if it can. Sir Walter's latest honour, his knighthood, and the completion of his difficult work of restoration in King Henry VII's Chapel at Westminster Abbey came one as the public recognition of the other at the very close of his life. It was fitting that he should be buried in the Abbey Cloister near to his last and perhaps his most important work.

The first article in this JOURNAL is a contribution from a distinguished foreign scientist on a subject fundamental to all modern building. Dr. Möller's wide experience of Continental methods is of particular value to us at a time when increasing attention is being paid to Continental practice. In some respects the article is a sobering corrective to unjustifiable enthusiasms for new building methods which have been adopted without any proper scientific testing and without the most severe testing of all, namely, that given by time alone. A method may commend itself in the first place because it satisfies practically all the requirements of the job. It may be cheap and easy to handle, may make dry erection and consequently rapid erection possible, may have desirable æsthetic qualities and admit the form of an acceptable "modern" structure. All of these things may be present and be accepted by the architect as sufficient proof that the method in question is what he wants, and yet the resultant building may almost literally be unfit for human habitation.

We talk a lot about design for living, thinking primarily in terms of sociology, plan fitness, and economics and very little about scientific testing. Sociological study in relation to building is absolutely essential. Its application demands vast extension and much improvement in method, but as far as building is concerned it can only present the objective: it cannot provide the means. The most elementary sociological study tells us that rehousing is necessary. More detailed considerations may point to the need for flats or houses of such and such accommodation and with such and such equipment and having various plan amenities. Only building science can give us the means to carry these ideals into effect with any certainty. Not merely "test tube" science, as it has been called, on materials prior to full-scale use, but science applied to buildings over a term of years.

This is now being done in Great Britain by the Ministry of Health Departmental Committee on working-class flats, by the B.R.S., and by many other organisations specialising in one or another aspect of building or class of building. What the architectural profession must learn to do is to pay more attention to the results of research than it has done in the past and to try to wipe out the mass of prejudices which cluster round any consideration of modern building and which hinder development by leading into blind alleys. All modern architecture is based on experiment and much experiment must be by means of full-scale building. It is easy enough to point out faults in modern work: the trouble is that we are too slow to realise where mistakes have been made, and, even when we realise that something is wrong, have been too slow to find the reasons and to rectify the faults. Dr. Möller quotes an authoritative scientific opinion that more than 100,000 flats built in Germany since the war are "unfit for human occupa-

tion because of insufficient heat insulation." This is no argument against flats or against the general principles which the architects of those flats were out to meet. It is solely an argument against their methods and their failure to study the social problem in all its aspects before building. If the importance of comfort had been fully realised it is probable that the aspects of building which contribute to comfort would have been given their fair share of consideration. Allowing, perhaps, some qualification for the scientific expert's human tendency to regard the fault he sees as paramount, this condemnation is serious enough to make us careful not to make wildly enthusiastic or critical comparisons such as that made recently in a contemporary that English housing has an architectural standard about the lowest in the world. Certainly a splenetic growl about English housing based, as such generalisations are usually based, on data insufficient to command respect does nothing to help.

Some critics, including Mr. Hope Bagenal, who writes a trenchant letter which is printed on page 1161, are inclined to ask for other than scientific data that all is well with modern housing. There is a vast field for improvement, but improvement can only be made by accepting the help which building scientists can give and by architects going more than half-way to meet the scientists by having a social theory which, though amenable to scientific influences, is based on something more than technical practice. We must certainly scrap outworn and non-progressive prejudices, but must take care that equally non-progressive prejudices based on raw social theorising are not put in their place. It is probably true, as Mr. Bagenal says, that there is too great inclination to treat engineering practice and the demand for cheap building as the paramount influences in building, leaving out many much more important considerations just because they do not conform to the tendencies of modern engineering practice or are not cheap. The scientific attitude can not only help in dealing with details. It can also help architecture to elaborate its own methods based on the social problems which it has to serve and not on methods derived from big business and economy.

The sessional papers programme for the coming year has now been prepared and will be issued with the new kalendars which will soon be sent to members. As usual, the chief emphasis is on subjects of current interest, "modern problems" in the fullest meaning of the term. The first paper after the President's Inaugural Address will be by Mr. L. H. Keay, of Liverpool, on Housing and Re-development of Central Areas. Later in the session Mr. Chalton Bradshaw will read a paper on Some Recent Bridges, based doubtless on his wide experience of research as Secretary to the Royal Fine Art Commission, which in recent years has been advising on the design of practically every bridge built in Great Britain. The design of bridges is a sphere of work in which architects have latterly had very little share. In the truest way it is one in which there can be genuine co-operation between architects and engineers, but there is no doubt at all that if architects are to regain the place they have had in the past as bridge builders they must be prepared to learn. Library Planning is to be discussed by Mr. H. A. Dod, of Liverpool, who is now designing the new library for Liverpool University, and Mr. Frank Dobson is to talk on Sculpture. Papers of a rather different character will be those by Mr. W. H. Ansell on Architectural Education and by Professor H. S. Goodhart-Rendel on the work of Beresford Pite and Halsey Ricardo. Interspersed among the sessional paper evenings will be two evenings arranged by the Social Committee, whose programmes are yet to be settled.

In recent years we have made a request at holiday time that members who have collected local architectural guide-books on their travels should pass them on to the R.I.B.A. Library unless they wish to keep them for their own use. Small guides are often the only printed sources of information available about out-of-the-way places. Often they are well written by local architects or historians and have good plans and pictures. This request is not only for monographs on ancient buildings; guides to modern buildings are just as valuable, though they are more likely to have been illustrated in the technical papers. Modern guides of the kind we want are such as that produced by the Swiss National Library at Berne, and an excellent architectural guide to Copenhagen recently published by the Danish Architectural Society.

Below we publish a photograph taken when the Exhibition of International Architecture was opened at Bristol by Sir Fabian Ware. With Sir Fabian Ware are Lady Ware, Sir Frank Cowlin, Mr. H. W. Maxwell, Mr. Mowbray A. Green, Mr. G. Talbot Plum, Mrs. Connor and Mr. F. C. Luke. On another page we publish an article on the Exhibition Policy of the R.I.B.A.

*"Western Daily Press and Bristol Mirror"*

# EXPERIENCE IN HEAT INSULATION

BY CH. MÖLLER, ARCHITECT, D.Sc. TECHN., BUDAPEST

*The author of the following article—the first of two—is a practising architect who is the official expert on insulation against heat, sound and damp of the Budapest Court of Justice. Dr. Möller has therefore had extensive practical experience in his investigation of cases, in addition to laboratory studies*

One of the most important features in house-building is to afford protection against unfavourable weather conditions: *insulation* is the means of obtaining that protection. It is a common mistake to imagine that proper insulation *prevents* the entrance of summer heat into and the passing of generated heat in winter out of a house. Insulation *diminishes only the rate of heat transfer*, so that in the same period and under the same conditions, less heat will be transmitted through a certain insulated wall than through the same wall uninsulated.

With the old thick walls, architects had little worry with heat insulation. Heat losses in winter and heat gains in summer were very slow and not at all high. The heat stored in the walls ensured a fairly constant temperature, irrespective of daily variations of outside temperature or of short heating pauses. Life was less hurried: sufficient time was given to build, to let the building dry before occupation, to give the thick walls and vaults an initial heating before winter. In one of our old castles guest rooms are still heated a week before the guest is expected and no heating is necessary in the last few days of his sojourn.

Nowadays engineering science enables us to build very thin—solid or cavity—walls, even to build skeleton houses where walls have no structural function and may be built of very thin and light insulating slabs or hollow blocks. These light walls, light floors, flat roofs, continuous reinforced-concrete structural members require good insulation, otherwise the house will not sufficiently protect its inhabitants and complaints will be raised against the architect, the builder and "flimsy modern building methods" in general.

Most of the information on heat insulation derives from physical laboratories insufficiently conversant with building methods. *The theoretical values* of such laboratories *were*, in many cases, *not enlightening but misleading* for the building profession. It is, for example, unfortunate for Germany that their technicians are apt to follow untried theories; they have built, under their enormous housing schemes, more than one hundred thousand flats "unfit for occupation because of insufficient heat insulation." This sad statement was made a few years ago by the foremost German expert on heat insulation, Dr. Cammerer, when he was in charge of supervising the heating comfort and the cost thereof in the new settlements.

The series of failures experienced compelled architects and builders to ask for a *revision of the testing methods* used in the physical laboratories, which formerly investigated the conductivity of small samples instead of full-scale walls or floors, thereby failing to reproduce the actual conditions existing in buildings exposed to weather.

At the same time, it was also necessary to *revise the standards* set for the manufacture of insulating materials. Practice has emphasised that besides heat insulation, other qualities are important, such as heat storing capacity, resistance against the penetration of moisture, strength, durability, constancy of volume, appearance and, last but not least, cost.

It was also found that the greatest mistake ever made in computing the efficiency of heating or heat insulation was to use the thermometer as a standard, instead of *human comfort and well-being*. The thermometer is a neutral instrument reacting on temperature changes merely by an expansion or contraction of its mercury content. Human beings are heat generators, feeling heat losses or gains, caused not only by contact with surrounding air of a certain temperature, but also by radiation and evaporation. Thus, under the same air temperature, we feel hot or cold according to changes in mutual heat radiation between us and the surrounding objects and to changes in the relative humidity of the air.*

Every house has a climate of its own, and the study of its minute details (the so-called microclimate) merits the full attention of architects. Adults live in higher air strata than small children, under quite different climatic conditions in the same room. Perhaps many of the chills and other diseases our childen suffer from are due to the unfavourable climate they live in not being recognised by their parents or teachers.

The author has had plenty of experience with faulty insu-

* An instrument, the eupatheoscope, has been invented by the Building Research Station to measure and record the physiological changes to which the author refers. This led to the invention of the eupatheostat to control electrically the apparatus heating a room according to the "comfort" conditions, in the way that a thermostat controls heating according to air temperature.—EDITOR.

lations and that is why he is emphasising—perhaps too much—in the chapters to come, the mistakes commonly made. Denouncing faults is not complete information. Perhaps some advice should have been given as to how faultless insulations are made. But space being limited, it is more useful to talk about failures to be avoided and about facts not easily found in textbooks on insulation, than to deal with principles of insulation well known from other sources, such as the excellent Building Research Paper, *Heat Transmission*,* by Dr. M. Fishenden and A. F. Dufton.

As many architects dislike mathematical formulas, we should try to introduce units of heat insulation which appeal more to the imagination. If we hear that the coefficient of air-to-air transmission of a certain wall is ·45 B.Th.U. per square foot per hour per degree F., or if we are told that the thermal resistance of a wall is ·95 hour per B.Th.U. per square foot per degree F., this does not mean very much to most of us. But if we say that the heat insulation of a certain floor is equal to that of a solid brick wall 24 inches thick, everybody feels that this insulation is ample. On the other hand, if we learn that the insulation of a certain cavity wall is equal to that of a 6 inch solid brick wall, there is no doubt about it being insufficient for an outside wall. Using 1 inch or 1 centimetre of solid brick wall as the unit of thermal resistance has been very satisfactory in Budapest, especially as the local Building Code requires for human dwellings an outside wall of "15 inches solid brick or equal," so that for new wall constructions or materials it has to be proved by experiment or calculation that they correspond at least to that thickness of solid brick.

## COMMON MISTAKES IN HEAT INSULATION

### Cavities Unfilled

This method of constructing walls, widespread in Great Britain and Northern Germany, is based on the erroneous assumption that the airspace between two thin walls is an excellent insulator: the wider the cavity, the better. This, unfortunately, is not the case. The following facts require consideration:—

(A) Still air is, in fact, one of the best insulators; but *in large cavities the air is always in circulation.* The air particles touching the hot surface of the cavity take a certain amount of heat which they lose when touching the cold side. Thus circulating air does not insulate, but it does facilitate the flow of heat. This latter increases with the size of the cavity and the difference of temperature of the surfaces.

(B) The hot surface emits *radiation* which the cold side readily absorbs. The transmission by radiation depends on the fourth power of the absolute temperatures. Thus, even for the same difference of temperatures, the radiation increases with the mean temperature—*e.g.*, a surface of 180° F. radiates much more heat towards a surface of 160° F. than a surface of 40° F. to one of 20° F.

* Building Research Special Report No. 11. H.M. Stationery Office. 9*d*.

The importance of heat radiation in cavities is illustrated by the fact that the heat flow through an airspace of 2 inches between brick walls is due, at a mean temperature of 32° F., in 7 per cent. to the conductivity of air, 16 per cent. to the circulation of air, 77 per cent. to radiation.

In hot climates it is unwise to use cavity walls or floors for protection against solar radiation, unless the cavities be subdivided by a granular fill or a series of thin partitions (*e.g.*, wallboard, aluminium foils). *At higher temperatures* (boilers, furnaces, drying kilns), *airspaces insulate less than the same thickness of solid brick wall* and should be only employed to allow for heat expansion.

Even for a very cold winter (0° F. outside, 70° F. inside) the insulating value of a cavity cannot be increased above a certain limit by increasing its thickness.

INSULATING VALUE OF VERTICAL AIRSPACES AT 35° F. MEAN TEMPERATURE

| Thickness of airspace, inches | ½ | 1 | 1½ | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|
| Thickness of equivalent solid brick wall, inches | 5¾ | 6 | 6¼ | 6¼ | 6¼ | 6 | 5¾ | 5¾ |

Thus it is useless to increase the width of a cavity over 1 inch; over 3 inches the insulating value decreases. For summer temperature in moderate climate, the above insulation equivalents should be reduced by about 15 per cent.

(C) In a heated room, especially with a number of persons inside, there is always a great amount of moisture in the air. In winter, the inner surface of the outside wall is, as a rule, colder than the air and thus a certain amount of condensation is almost sure to occur. This is unnoticed if the surface of the wall is dry and absorbent (*e.g.*, lime plaster); we are not aware of the condensation unless the surface is saturated to a certain degree, which causes a dark "moist spot." After complete saturation, or if the wall is non-absorbent (glass, glazed tile), the condensation forms small beads of water; the wall "sweats."

The condensed water absorbed by the inside surface of a cavity wall partly evaporates into the airspace which is kept at a very high relative humidity. Dr. Cammerer measured relative humidities between 73–92 per cent. in wall cavities in the early spring. In winter, the water-bearing capacity of air being less, the relative humidity is greater and causes condensation, also ice crusts on the outside surface of the cavity. I have seen cavities in refrigerating plants quite filled up with ice and bursting the wall.

Though this may not happen with cavity walls of dwelling-houses in England, it may easily occur in Canada or the United States, especially with walls of rooms in which vapours are generated (kitchen, bath, laundry). Personally I should not omit heat insulation in view of the "mild climate" of England. During my few visits, I have experienced both a very cold winter

with a bitter north-east wind blowing through the crevices of my house, and an exceedingly hot summer.

Hollow blocks with large cavities, as used frequently in reinforced flat roofs, do not ensure sufficient insulation, as such roofs suffer much greater heat losses in winter and heat gains in summer than vertical walls.

### Coefficients of Heat-Conductivity have mostly been Measured on Samples Artificially Dried

Dr. Stradling, Director of the Building Research Station, proved that most building materials, especially concrete, mortar, sandstone, sand-lime brick, contain a a certain amount of "colloidal" moisture, being in proportion to the steam tension of the moisture in the air. As the air is never dry, a relative humidity of 70-80 per cent. being quite common, such building materials never dry completely unless heated well above 212° F. Also, such materials easily absorb into their capillary pores rainwater or condensation which they very slowly lose. (A towel immersed in water is wet in two seconds and does not dry in many hours, especially when the air is humid.) Thus, in apparently dry outside renderings, Dr. Cammerer measured an average "captured moisture" of 5–10 per cent. by volume, but he had cases with 17 per cent. water content.

As *water is about 25 times a better heat conductor than air enclosed in the pores* of a building material, it is clear that materials exposed to weather (which we will call "air moist") or to the air inside a house (which we might call "air dry") insulate less than samples dried artificially and tested between electric heating plates in laboratories.

The coefficients of conductivity thus obtained are not only misleading in themselves, but also with regard to the relative value of various insulating materials. Certain materials do not permanently capture humidity (*e.g.*, well-burnt bricks free from hygroscopic salts; glass; high grade impregnated cork slabs), so that laboratory data are fairly in agreement with field measurements.

Other materials, such as concrete, plaster of paris and especially pumice-concrete, a material widely used in Germany and Holland, always contain more or less permanent moisture—pumice-concrete up to 15–20 per cent. by volume—so that their heat insulative efficiency is much less in practice than shown in propaganda pamphlets emphasising favourable laboratory certificates.

Very small amounts of moisture materially reduce the insulation. According to tests carried out at the Research Station for Heat Insulation at Munich, a moisture content of 1, 2·5, 5, 10, 15 per cent. by volume causes an average reduction of the insulation by 23, 36, 44, 52, 57 per cent. Therefore bricks containing hygroscopic salts may insulate 30–40 per cent. less than bricks free from such salts.

New brick walls take a long time to dry, as they not only contain water partly bound by colloidal and capillary pores, but also hydrate water chemically bound and set free gradually as the carbonisation of lime advances. The Munich Research Station measured the following coefficients of heat-conductivity (metric) of a brick wall built in a heated room of the laboratory, not exposed to weather:

| | |
|---|---|
| New wall .. .. .. .. | 1·2 |
| After 4½ months .. .. .. | ·84 |
| Brick alone, artificially dried .. .. | ·39 |

Field measurements carried out by Dr. Hofbauer (Vienna) with his extremely sensitive heat-flow meter (a rubber plate with several hundred thermo-elements which he simply sticks on the wall to be tested) showed an average coefficient of ·75 for external and ·60 for internal walls (metric), which now has been adopted as a standard all over the Continent.

The insulating value of an external brick wall being always less than that of an internal one, it is a very unfair practice of certain manufacturers of insulating material to compare in their catalogues their dry materials with the equivalent thickness of "air-moist" external walls. It looks attractive to write that 1 inch of a certain insulating board offers the same protection as a solid brick wall 15 inches or even 20 inches thick, but in practice this is very seldom the case. The author has taken out of buildings insulating boards completely wet and mildewy because of condensation or contact with a new wall not sufficiently dry. Wet boards do not insulate enough to prevent condensation, and condensation keeps them wet. There is no escape from this vicious circle until the next summer when both the wall and the insulating board dry out.

The same is the case with brick walls of houses completed in the autumn. In Hungary, we consider the insulation of an external (air-moist) brick wall of 15 inches sufficient to prevent condensation, except for exposed aspects or rooms with a very high relative humidity. But the insulation of a new brick wall of 15 inches is not more than the equivalent of about 8 inches, which cannot prevent condensation in a cold winter.

Heating, before the house is plastered, materially improves houses completed before winter; but condensation, at least in the corners, is almost sure to occur, except with very careful and intelligent heating and ventilating not to be expected from the average tenant. The author experienced one case where, in an apartment house with 15 flats, finished in November, one flat was absolutely spoiled by condensation, water dripping down the external corners of the rooms, the distemper badly damaged, all furniture and pictures moist, the shoes in the cupboards mildewy. In this particular flat old people lived who had an exceptional fear of fresh air, overheated the rooms and never ventilated them. (There was no fireplace.)

The increased conductivity of new brick walls causes repeated complaints against central heating installations or stoves in the first winter. Though the old proverb, "Rent your new house in the first year to your enemy, in the second to your friend, in the third move

in yourself," applied more properly to the old houses with thick walls, occupation before the walls are fairly dry is not only unhygienic but also causes exceptional heating expense. In one case before the Budapest Courts it has been proved that the excess over that guaranteed for a fairly dry house amounted to 64 per cent., caused by walls not dried before winter.

Condensation on conductive walls, floors and ceilings may also cause other damage than heat losses. In many cases, where unrented flats have not been heated and there has been a heated flat beneath, vapours condensed under the unheated floor have caused rot in the sub-flooring or expanded the oak block flooring like a vault. The tremendous pressure of expanding wood has thrust out the main walls a few millimetres, causing horizontal cracks on the elevation along the floor lines.

### In Laboratories Small Samples and not Entire Walls have been Measured

The mortar is, as a rule, a lesser insulator against heat than the brick of which it fills the joints. When this was recognised, average coefficients of heat-conductivity have been computed—*e.g.*, if a brick wall consists of 78 per cent. of brick and 22 per cent. of joints going through from one surface to the other and the coefficients of conductivity be ·60 for the brick and ·90 for the joint (metric), the average coefficient will be

$$\cdot 6 \times \cdot 78 + \cdot 9 \times \cdot 22 = \cdot 665$$

Such average figures may be misleading in practice, as the heat flow is not distributed into an average uniform intensity. The joints lead more heat away, proportionately to their surface, than the bricks; consequently they are colder in winter and it is very likely that condensation occurs at the joints before it appears at the brick surface. The dust sticks to the moist spots and so we see soon the pattern of the joints at the surface of the wall. This is, as a rule, not a sign of moisture penetrating from the outside, but of *unequal heat insulation.** That is why we often see dark stripes on ceilings exactly where steel joists or reinforced concrete ribs run uninsulated.

But the insulation of such "heat bridges" should not be overdone. In one building investigated by the author a steel girder concealed in the ceiling of an upper bedroom was thoroughly insulated by cork slabs, while the slabs between the joists were reinforced concrete floors with hollow blocks of the Kleine type, with some cinder fill as additional insulation. The vapours of the adjacent bathroom condensed on the cavities of the blocks which they darkened, the joints between the blocks were a little lighter and the well-insulated girder stuck out as a clean white stripe on the ceiling.

### The Importance of Heat-Retaining Capacity has not been Recognised

The usual heat transmission calculations assume the ideal condition of a constant and uniform heat flow very seldom realised in a building. In fact both the outside and inside temperatures fluctuate and the heat flows in and out across the walls.

In the opinion of heating engineers the heat storing capacity of heavy walls and floors is rather a drawback, their initial heating requiring larger boilers and more radiation. Certainly there are some buildings in which heat storing is undesirable. A church or lecture room not in constant use should not have heat-absorbing walls, or else in the beginning of any heating period most of the heat is absorbed by the walls, the surface of which still remains cold. The congregation or audience, radiating heat towards the cold walls, feel cold and more uncomfortable than outside in the cold open air. When the heating ceases and the walls begin to give back part of the retained heat into the interior of the building, the room is no more in use and the heat stored is absolutely wasted.

On the other hand, in dwelling-houses we require a fairly uniform temperature day and night, as we are very sensitive even to small variations of temperature. The heating system works, as a rule, periodically. In many cases no fire burns at night or at least early in the morning. Walls may insulate very well, but if they cannot store a certain quantity of heat, both their surface and the air in the room will soon cool down lower than should be permitted. The author has lived in a mansard room quite comfortable when a fire was burning in the iron stove, but so cold in the morning that there was a thin ice-crust in the wash-basin. The temperature of the wall may be so low as to cause condensation, which spoils the insulative efficiency of the wall.

Honigmann and Bruckmayer investigated walls of various materials but of the same coefficient of heat transmission. At 20° C. (68° F.) outside and 0° C. (32° F.) inside wall surface temperature they stopped heating. After 12 hours the inside surface temperatures were:

11.2° C. of a brick wall 15 inches thick.
9.0° C. of a breeze-concrete wall 11 inches thick.
2.6° C. of a soft wood wall 3 inches thick.
.9° C. of a 2 inch insulating board wall.

Therefore, for dwelling-houses without a permanent and automatic heating plant, a light wall of insulating slabs is not as valuable as a solid, heavy wall of the same heat transmission. We need the "flywheel" function of the stored heat.

Heavy, solid walls with a high-grade insulating material inside are supposed to be excellent in winter. They are not. The line of middle temperature goes through the insulation; the heavy wall is on the cold side and stores cold, while the warm side, being very light, does not store enough heat. Thus the interior surface of the wall cools rapidly in the heating pause.

In one such case a solid brick wall of 15 inches was lined with 1½ inches of cork, to increase the insulation. The joints between the cork slabs were filled with

* See Building Research Bulletin No. 10. *The Prevention of Pattern Staining of Plasters.* H.M. Stationery Office. 4d.

gypsum and the whole surface was plastered and papered. The cold, stored in the solid brick wall, cooled the joints in the heating pause so that their pattern soon appeared on the wall paper, owing to condensation. Without the cork slabs, no pattern would have appeared on the paper, the insulating efficiency of the brick wall being sufficient.

In another case the 5 inch outside brick wall of a bedroom was lined inside with 1½ inches of cork, the total insulation corresponding to a solid brick wall of 27 inches. Nevertheless, this wall was damp and mildewy. After a few experiments it became evident that the tenant, leaving early in the morning for his office and returning at late hours, did not heat the room all day, and meanwhile the cork surface had been cooled by the cold stored in the brick wall. The vapours coming from his bathroom and kitchenette caused condensation all over the wall, reducing also the insulative value of the cork. Had the cork been applied outside, the wall would have stored heat and condensation would have been avoided.

This experience should be especially borne in mind as there is an increasing tendency to replace solid walls by light insulating slabs even in cottages and bungalows, where their financial advantages are not at all obvious and the acoustical protection they afford is also inferior to that of a solid wall.

### The effect of Wind has not been taken into account.

The architect's dilemma regarding windows and entrance doors is: either they are tight and, consequently, are difficult to handle, or they fit loosely and cause excessive heat losses in winter.

Dr. Raisch found surprising results as to the quantity of air going through cracks or open joints of windows tested in a wind tunnel. At the very low air superpressure of 1/10,000th atmosphere, the air transmission amounted to 40 cubic metres per hour for an average single window, 544 cubic metres per hour for a crack 1 metre long and 5 millimetres wide.

As the heating of 1 cubic metre of air from −10° C. to +20° C. requires 9·3 metric calories, the heat loss caused by such a crack, quite common with entrance or terrace doors, is $544 \times 9{\cdot}3 = 5{,}059$ metric calories per hour, while the heat loss through 1 square metre of a 15 inch brick wall, under the same conditions, amounts to 40 calories per hour only!

No heating device or apparatus can cover such large losses. In one case dealt with by the author, a flat could not be heated up to 64° F., with a mild winter temperature of 29° F., when wind was blowing. The tenant abandoned the flat and the proprietor claimed for the rent due. It was found that there was an open crack round the windows, partly due to shrinkage of the wood frame, partly to negligent setting of the windows. Cold air streamed in with a velocity sufficient to blow out a burning candle. When the joint was caulked, the oversized and overheated ceramic stove raised the temperature to 77° F. within half an hour.

Another detrimental effect of wind is to drive the rain into the pores, unfilled joints and cavities of outside walls, thus wetting the wall and materially reducing its heat-insulating efficiency. To prevent this fault, joints filled with good mortar and a water-repellent stucco should be used. For houses in very exposed sites, an insulation against damp (*e.g.*, bitumen) under the stucco or impregnating with paraffin is advisable. In Austria, the weather side of houses is often covered with wood shingle, slate or asbestos slate, which afford perfect protection against driving rain penetrating the walls.

### Protection against Sunshine has been omitted.

Architecture is, unfortunately, very often an expression of fashion rather than that of common sense. The neo-classical buildings in Scotland are very dark inside, as their style has been developed under the bright sunshine of Greece. On the other hand, we see modern houses resembling glass cages in Southern France and Italy, where it is more desirable to keep the blazing rays of sunshine out than to let them in. Many complaints have arisen, in the author's country at least, against mansard rooms and rooms under flat roofs as being intolerably hot in summer. Flat roofs are exposed to solar radiation from the morning till the evening, while vertical walls are in shadow part of the day. In Budapest, supposing a cloudless sky, the total heat received by direct solar radiation during the months May and June, upon 1 square metre of surface is:

4,000 metric calories for a wall facing north
79,000 ,, ,, ,, ,, ,, east or west
87,000 ,, ,, ,, ,, ,, south
221,000 ,, ,, ,, a horizontal roof

Therefore, much more protection is needed for a flat roof than for walls. Light insulating flat roofs over living-rooms are useless; a heavy mass should act like a flywheel, absorbing heat during the day and radiating it during the night.

Heat losses on bright nights, by radiation towards the very cold sky, are also many times greater than the radiation losses of walls which are partly compensated by reradiation from opposite houses.

A few years ago the author had to investigate a workshop under the sheet iron roof of a factory, crowded with working girls, so hot in summer that some of the girls fainted. It was proposed to line the ceiling with a proprietary fibre board, half inch thick. A quick calculation showed that insulation alone could do nothing: the persons working in the room generated enough heat to make conditions intolerable, even without solar radiation on the roof. The measures taken were:

(*a*) reducing the number of workers in the room;

(*b*) providing sufficient ventilation, so that workers were refreshed by evaporation;

(*c*) to reduce the heat radiation emitted by the ceiling,

the roof has been painted outside with aluminium, and inside a reinforced concrete slab of 3 inches (mass), lined with cork 1 inch (insulation) and plastered over smoothly, has been installed.

There are cases where a room under a flat roof, and more so one under a glass roof, affords living conditions only if there is a forced ventilation with cooled air or the roof is steadily sprinkled with water. For glass roofs shading devices should be taken into consideration.

A very effective means of protecting south windows against excessive heat in summer is a projecting cornice above the window. In winter the sun stands low and is not obstructed by the cornice. In summer, when the sun stands high, the cornice keeps part of the window in shadow.* No such protection is possible for windows facing west. In a Continental climate, the western side of a house is too hot in summer, except when the windows are fitted with louvres or rolling wood-lattice blinds.

### Uneconomic Grouping of Rooms

Houses standing free are exposed on all sides to cold air, but receive a certain compensation from the sunny aspect. Therefore, it is economic to place the heated rooms towards the sunny side and group the staircase, larder and storage rooms to the north. The drawback of that arrangement is that a difference of temperature between the heated and unheated rooms will be met with. (Even in summer there may be a difference of 7–8° C. between rooms of different aspects, as measured in houses people were living in.)

In Germany tests have been carried out with a typical house, consisting of a living-room and kitchen on the ground floor, two bedrooms and a bathroom on the first floor. The heating of the house required 3,200 kilos of coke in one season. Same house, joined to a similar one as semi-detached house, used 3,100 kilos when the staircases were placed at the party wall (to provide more sound insulation) and 2,500 kilos when the staircases were outside and the heated rooms at the party wall.

What should we do, then, to insure good heat insulation? The author feels he has left this question unanswered. But if an architect does his best to avoid the mistakes described above and opposes sound criticism against methods of salesmanship, he will avoid failures of a serious nature.

* The same applies to balconies in flat buildings. A balcony over a bedroom window facing south is far from being a disadvantage.—EDITOR.

# Industrial Psychology in the Training of Architects

By C. SCARBOROUGH (*The National Institute of Industrial Psychology*)

*It is suggested that the methods successfully employed in discovering the suitability of candidates for various careers might well be applied in architectural training. Tests of the kind here suggested would have two objects: to discover whether the profession of architecture is at all a suitable career for the candidate examined; and if he or she is generally the right kind of person, what special aptitudes (e.g., designing, "practical" work, or "business") they are likely to develop.*

Few people would deny that a taste for drawing and some ability at draughtsmanship are not alone sound indications that a boy has in him the makings of a good architect; but the possession of just those talents and no more has decided many to enter the profession, and on this basis they start their training. Even if quite a number are eliminated sooner or later in the course of their studies, it is obvious enough that many men and women are launched into the profession possessing only a few of the many and diverse temperamental and mental qualifications necessary for the completely equipped practitioner.

The architects', like every other profession, is concerned with the problem of ensuring that the boys and girls accepted for training are those likely to be successful not only in their examinations but also in their subsequent work. The schools of architecture do not want to waste their time in teaching students who will never qualify, or having qualified will never succeed in the profession because in one way or another they are misfits. It is commonly agreed that overcrowding in the profession, if it occurs, would be due, not to a glut of good architects, but to a glut of the mediocre and incompetent. The prestige of the whole profession is lowered by every piece of poor work executed. The examinations test mental ability, but what means are employed at present to test psychological suitability?

Into the discussions of this problem, the psychologist enters with some diffidence. He is prepared to be asked once again what *he* knows about architecture. How can he, an outsider, hope to have anything useful to say about a problem which in essence is one solely concerning the profession; and he is prepared to explain yet again that being an outsider is very useful since it enables him to take an impartial view, and that since the entrants to architectural schools are human beings, they are the subjects of his science.

For years the psychologist has been dealing with the problem of the choice of careers by boys and girls, and has evolved methods of occupational testing which have

thoroughly proved their validity. Any type of work requires first a certain amount of intelligence—high in the professions, comparatively low in, say, routine manual work. The psychologist's tests enable him to measure the intelligence of a boy or a girl, and thereby to gauge his subject's suitability for the occupation he has chosen, as far as intelligence is concerned. But there are many abilities required—mechanical ability for the engineer, literary ability and particularly literary fluency for the journalist, and so on. These abilities also can be measured by special tests.

Then there are the problems of temperamental traits demanded by the various careers. If the teaching profession is under consideration, for example, the psychologist must discover whether the boy or girl before him has such qualities as patience, emotional stability, the constellation of qualities which make up leadership, and so on. He has no tests to help him here, but he has evolved a technique which enables him to build up a picture of the temperament of the boy or girl. Thus with a knowledge of the psychological demands of occupations, he is able to determine the career in which a boy or a girl will find his best chance of success and happiness.

There is not space here to discuss these methods in any detail, but the National Institute of Industrial Psychology, which is responsible for the work in this country, has found that they do achieve, to a surprisingly high degree, the ends for which they are designed.

This being so, why should the psychologist feel some diffidence in intruding into the architect's discussion of entry into his profession? Surely this psychological technique can be adapted for the examination of would-be entrants? The psychologist agrees: it can. But he realises also the difficulties. An architect has to be so many things. He must have creative artistic ability. He must have practical ability; he must be able to "see" in three dimensions; he must deal with quantities; he is concerned not only with the appearance and convenience of a house, but with its structure and its drains. And finally, he must be able to deal with the business and legal side of his occupation; and he must supervise work in progress. In fact, it is becoming recognised that architecture really consists of three types of work—designing, "practical" work, and "business"; and behind them all is required an unusually developed power of "sympathy." He must be quick in his reactions to the ideas of his clients, both as designer and business man, and in his practical work and his contacts with workmen must be self-possessed and full of human understanding. In America there is a tendency for architects' offices to be staffed according to these divisions, and the same tendency is increasingly evident in England.

Since this tendency has not developed very far, however, the psychologist would have to look for all of them in would-be architects. He would have to decide to what extent suitability for the second and third branches, say, would outweigh deficiencies in the first—and that not only in the exercise of the profession but in the passing of qualifying examinations. He would want, before he undertook the job, to make a more thorough examination of the work of the architect than any he has yet been able to make. He might even start to work out new tests for use with candidates for entry.

But he would hold quite emphatically that his contribution would be a valuable one. He would be the last to lay claim to infallibility; but he would claim that his methods were an immense improvement on any that exist at present. They might let a few misfits enter—but not nearly so many, he would hold, as seem to wriggle through the meshes of the present system.

The psychologist has in his favour two great considerations: that he would approach the problem from the point of view, not of what candidates have done in the past, but of their capabilities for the work in which they wish to spend their lives; and that his special studies have led to the evolution of a definite technique for assessing the psychological factors which have a very great influence on the success of an individual at his work.

This article has attempted to do nothing more than touch on the subject. Subsequent articles will treat other aspects of the psychological background to architecture, and it may be possible to probe deeper into the subject of the present article. Certainly, to teachers in architectural schools and to their would-be pupils, nothing could be more important than assurance, of the kind which this article suggests can be given through the methods of industrial psychology, that the right people, and only the right people, enter the profession.

*The principal entrance front of the semi-circular group (Block "D")*

# SLUM CLEARANCE IN LIVERPOOL

## THE ST. ANDREW'S GARDENS REHOUSING SCHEME

*Architect: L. H. Keay, O.B.E., M.Arch.(L'pool) [F.], Director of Housing*

### HOUSING POLICY

The slum clearance and rehousing work undertaken by the Liverpool Corporation through their Housing Director has attracted a good deal of attention on account both of its scale of operation and of its quality. The following is an account of the general intentions and methods, in rehousing, illustrated by one scheme, that of St. Andrew's Gardens.

Like many other municipalities, Liverpool at first developed on available frontages when providing dwellings in the inner areas. Latterly they have rightly adopted the view that large rehousing schemes should be considered in relation to the necessary replanning of roads, in fact, town planning as it is understood to-day. As an instance of this policy it may be mentioned that the City Council has already taken advantage of the provisions of the Housing Act passed in the last session of Parliament, and submitted to the Minister of Health

a proposal affecting the entire replanning and redevelopment of an area of over 50 acres in the heart of the city. This change of viewpoint is to a large extent due to the advice of the Director, as he has constantly urged that to undertake adequately the very large schemes of rehousing that were demanded, considerable freedom in the replanning of whole areas was necessary.

This policy has involved an unusual degree of forethought in organisation of the work and has even influenced the structure of the new buildings. It has rarely been desirable, and in some cases impossible, to clear the whole extent of an area at once. The trouble and cost of decanting the populations involved in these large-scale schemes had to be avoided as much as possible. Therefore building work had to be undertaken piecemeal; this demanded a type of structure which could easily be built in series and as far as possible without the use of cumbersome building plant. The description of the structure of the St. Andrew's Gardens scheme will illustrate how this is done.

Since the new buildings have to be maintained by the Corporation and the tenants are transferred from slum properties, it was obviously desirable that the structural work and materials should be of good quality. The ever-necessary effort to reduce cost is therefore made not at the expense of quality in materials, but in building organisation.

The adoption of normal methods of construction, standardised units and simplicity in design make it possible for small contractors to submit tenders. Such contractors commonly have small overhead charges, and are therefore able to compete satisfactorily with the larger firms. Certificates are issued at frequent and regular intervals and to a high percentage, a skilful system of measurement making this a safe proceeding: this reduces the financial covers with which the contractor must safeguard himself; when tendering, he is certain that he will be able to pay promptly for his materials and obtain his cash discounts. Finally, thorough organisation of contracts avoids losses through delay or congestion as much as possible.

## PARTICULARS OF ST. ANDREW'S GARDENS

On 21 June, Sir Kingsley Wood, the Minister of Health, gave the name of St. Andrew's Gardens to the Trowbridge Street rehousing scheme on the occasion of the formal opening of the largest block of the 316 flats comprised in the scheme.

The major portion of the site was previously occupied by the old City abattoir, and was appropriated for the rehousing of persons dispossessed by the clearance of the first portion of the Gerard Street Unhealthy Area under the Housing Act, 1930.

Development has taken place in successive stages. The first block (C) was commenced in November 1932, and contains 75 flats, of which 16 have two bedrooms and 59 three bedrooms. This was followed by Block B of 45 flats (5 two-bedroom and 40 three-bedroom), and Block A, 40 flats, 15 of which have two bedrooms and 25 three bedrooms. Block D, the last block of the present scheme, comprises 4 one-bedroom, 46 two-bedroom and 106 three-bedroom flats.

Extensions on either side of the scheme, which have been approved by the Housing Committee, will eventually increase the total number of flats in the scheme to over 700.

## THE SITE AND LAY-OUT

The lay-out has been conditioned by the necessity for preserving existing streets and by the open railway cutting of the L.M.S. Railway Co.'s main line, which runs obliquely across the width of the site. Block D at the north end of the site, through which St. Andrew Street is continued as a thoroughfare for pedestrians only, is noteworthy for the "horseshoe" plan, which has an outside radius of 148 feet.

The new buildings are five storeys in height, each floor being identical in plan save where entrance archways pierce the lower storeys. Each flat adheres to a standard unit plan according to the number of bedrooms provided. The accommodation common to all flats is a living room, scullery, bathroom, hall, larder and fuel store. Access to the flats is from continuous balconies which connect to common stairways; balconies serving more than five flats are accessible from at least two stairways.

## STRUCTURE

The construction follows the standard practise of the Department. Mass concrete piers taken down to a solid rock foundation support reinforced concrete lintols which carry the brick external walls, stair and party walls. External walls are 14 inches thick up to the fourth floor level, and 11 inches above; party walls and the inner walls of stairways are 9 inches thick, whilst partition walls within the flats are $4\frac{1}{2}$ inches in thickness.

External facings are light wave rustic bricks of golden brown colour obtained from the St. Helens district, with

*The courtyard of Block "D"*

a darker shade for plinths. Mortar is of a yellowish tint and horizontal joints are grooved with a rounded jointing tool, vertical joints being flush with the brickwork. Copings, chimney caps and other dressings are in artificial stone, and the access stairways have pre-cast concrete steps. Balcony fronts are constructed in brickwork 9 inches thick, stiffened by reinforced concrete uprights joined to the balcony slab.

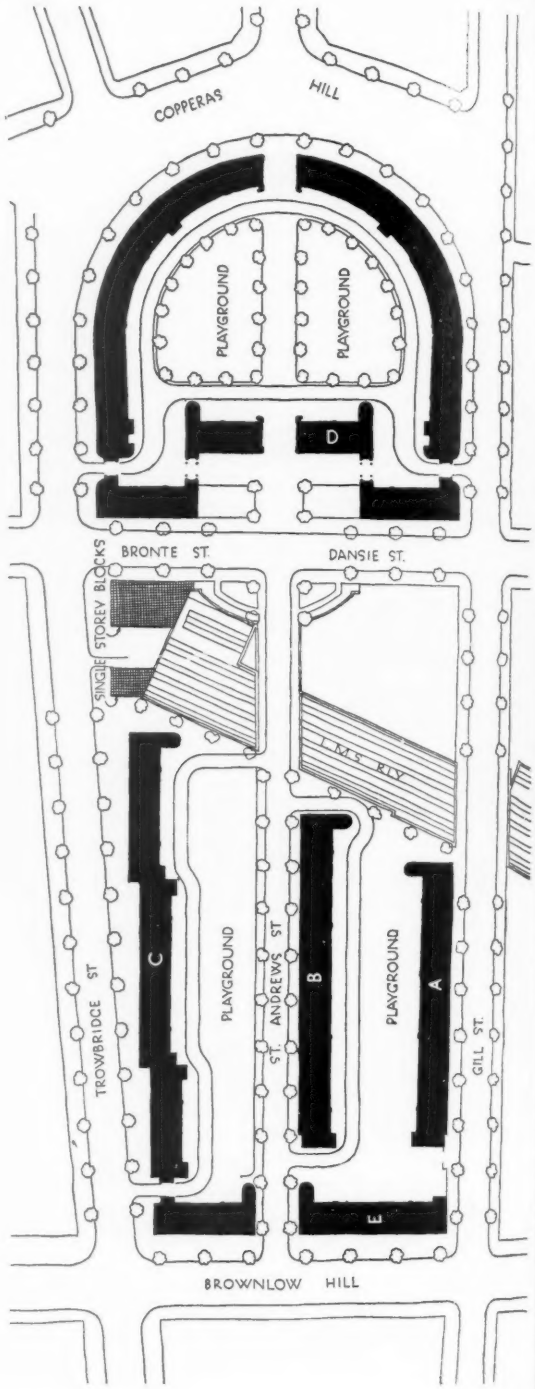
The elevational treatment differs from that of earlier schemes by the Department. The steel windows give a greater glass area than the sashes previously used, and result in a horizontal effect in the elevations. This has been emphasised by the recessing of alternate courses of brickwork between the windows and by the projecting soldier courses at the heads and cills being carried through as continuous bands. Private balconies have also been provided in a number of living rooms.

The ground floor is a solid concrete slab reinforced where necessary according to site conditions and the upper floors are of reinforced concrete (of "Truscon" design) spanning between the external walls and a central beam which is incorporated in the floor construction. This beam bears on the party walls and is supported about the centre by a reinforced concrete column which passes through each unit. Balconies are cantilevered out from the floor slab, the tapered cross section providing a continuous smooth soffit beneath.

Roofs are of normal timber construction; bitumen felt is laid between the common rafters and battens; the covering consists of locally made 18 inch by 12 inch concrete tiles of very dense material and most attractive colour, which the Department has used extensively for the cottages in the newer estates on the outskirts. Cast iron gutters behind the parapet walls to the street elevations are at a level which permits the connection of outlets to copper pipes which pass through the roof space and discharge into rainwater heads on the courtyard side; down pipes on the street façades are thus obviated. The soffit of the overhanging caves on the internal elevations is finished with a proprietary pressed building board in one width. Small flat roofs over stair towers, etc., are of reinforced concrete covered with asphalt.

Ceilings are of plaster board nailed to the fillets on the underside of the ribs in the floors and to ceiling joists in the uppermost storey; the joints in the plaster board are covered with scrim and the whole surface finished with a thin floating coat and a skimming coat. Walls are plastered two coats except to sculleries, bathrooms, larders and fuel stores, which are flush pointed; these walls are faced with sand-lime bricks which provide a superior surface and facilitate the application of water paint.

Floors to halls, bathrooms, larders and sculleries are in quarry tiles, the living room and bedroom floors are of 1 inch thick T & G spruce boarding nailed to creosoted dovetailed fillets; the undersides of the boards are creosoted and in the case of the ground floor a thick coat of bitumen compound is interposed between the boards and the fillets and carried 1 inch up the walls. Skirtings to flush pointed walls are in pressed bricks and to plastered walls are of cement 4 inches high with a 1 inch by 1 inch




*Aerial perspective of the complete scheme showing the side extensions*

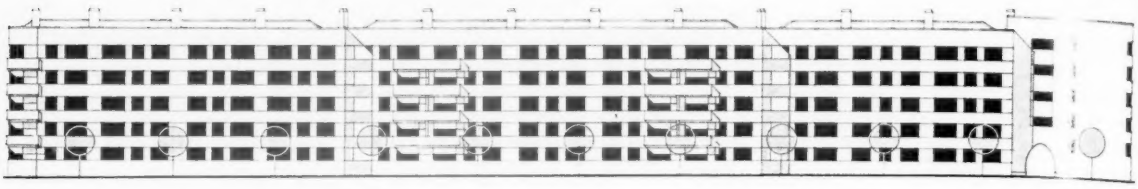
quadrant fillet fitted in the angle between the skirting and all wood floors. Picture rails which were provided in the earlier blocks have been eliminated in Block D in favour of picture hooks fixed in standardised positions in all living rooms and bedrooms. The living room ceilings are relieved by a simple plaster cornice. Windows are steel casements in wood frames with teak cills, the casements being treated with a zinc spray rust preventative.

## EQUIPMENT

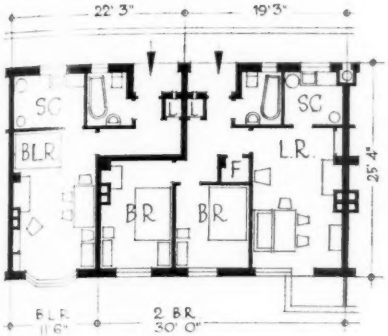
The largest bedroom in each flat is equipped with a small open firegrate and each living room contains a combination range with side oven and back boiler which supplies hot water for domestic purposes. The hot water cylinder is fixed in the scullery and serves sink and bath. All water pipes are in copper. For the cold water supply a 1 inch high pressure rising main feeds a 350 gallon tank in the roof space, from where supplies are taken to the five flats immediately beneath. Provision has been made for a booster pump which could be brought into action should the mains pressure become insufficient.

The scullery equipment includes a glazed fireclay sink with drainer, gas-heated wash boiler with independent fume extractor, three rows of shelving and a clothes drier. Other miscellaneous equipment includes a dresser-cupboard in the living room, hat and coat hooks in the hall, and brass curtain rail and runners to all front windows and bedroom windows overlooking the courtyards. Brackets projecting from the access balconies are provided for attachment of lines for clothes drying.

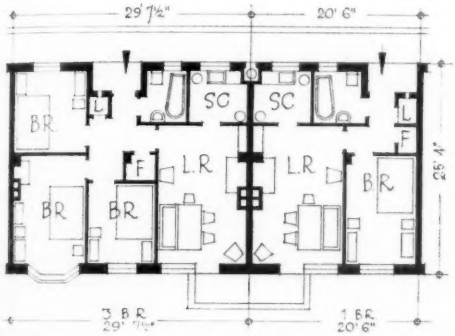
Refuse disposal is effected by ash chutes consisting of 15-inch internal diameter glazed socketted stoneware pipes with access hoppers at each balcony level and discharging into galvanised steel containers in compartments accessible from the service roadways; each chute serves two or three flats on each floor. Individual bins



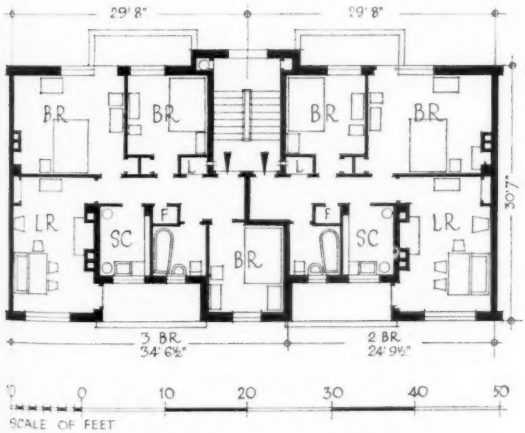
*A detail photograph showing typical windows, wall treatment, balconies and entrance archway*




*Balcony access type with bed-living-room and two bedrooms*




*Balcony access type with one bedroom and three bedrooms*




*Enclosed staircase type with two bedrooms and three bedrooms*

*Reference to all plans: SC., Scullery; B.L.R., Bed-living Room; L.R., Living room; B.R., Bedroom; F., Fuel; L., Larder.*

are incorporated in the yard walls for the use of ground floor tenants.

The electrical installation in each flat is supplied from vertical risers passing through the larders, where meter connections are made by sealed three-pin plugs. All conductors are tough rubber compound insulated and braided of 600 megohm grade run in heavy gauged welded screwed conduit, lamp holders of non-conducting material, enamelled steel shades and lamps are provided for all tenants' lighting points. Balcony and stair lights are fed from independent circuits controlled by time switches, the fittings being cast iron Wigan Lacent type.

## FINISHES

Decorative finishes are water paint on all internal walls, all joinery is enamelled and floor boards are painted one coat of wood preservative. The external wall faces abutting on access balconies are finished in cream water paint down to the level of the top of the balcony. In Block D this treatment has been carried down to a black plinth at yard level. The stairways in this block are finished in synthetic paint, a dado of jade green and cream above.

The service roadways are of concrete and the children's playgrounds in tar macadam surfaced with Jersey gravel. Footwalks are buff artificial stone flags; panels of green flags are introduced in the wide pavings in Block D. The playgrounds to Blocks A, B and C contain small plantations of flowering and evergreen shrubs; plane trees have been planted by the railway cutting and around the courtyard in Block D, where gymnastic apparatus painted in bright colours is provided for juniors and seniors in two separate enclosures.

The cost of the scheme as now completed is approximately £133,450, and the average cost per flat is £422 gross, inclusive of service roads and sewers, playgrounds, etc., and £402 net.

## CONTRACTORS AND SUPPLIERS

*GENERAL CONTRACTORS:* J. Jones and Sons (Woolton), Ltd., Liverpool.

*STRUCTURE:* Bricks, Ravenhead Brick Co., Ltd. Reinforced concrete work, designed by the Trussed Concrete Steel Co. and executed by the General Contractors. Artificial stone, Pearson Bros. and Campbell, Ltd. Roof tiling, Manchester Slate Co., Ltd. Concrete roof tiles, Robert Abraham, Ltd. Steel windows, the Crittall Manufacturing Co., Ltd.

*STRUCTURAL FINISH:* Plaster work, Adams Bros. (Liverpool), Ltd. Plumbing, R. Roughley and Son. Electric installation, T. Jones and Co. Light fittings, General Electric Co. and Falk, Stadelmann and Co., Ltd., and Wigan "Lacent." Plaster ceiling slabs ("Thistle"), British Plaster Board, Ltd. Rainwater goods, Walter Macfarlane and Co., Ltd. Painting, W. Wilcock, Ltd. Paint, Walpamur Co., Ltd., and Paripan, Ltd., and Nobel Chemical Finishes, Ltd., and North British Chemical Co.

*EQUIPMENT AND SUNDRIES:* Lightning conductors, H. G. Riddell. Title lettering, J. B. Pearson (Birmingham), Ltd. Curtain rails, Roy and Miles, Ltd. Fencing, E. Wilson and Co. (Collingwood, Ltd.). Roads, paving and sewers, Lawrence Marr and Sons. Teak seats, Castle Shipbreaking Co., Ltd. Gymnastic apparatus, H. Hunt and Son.

# THE REPAIR OF VAULTED BUILDINGS

## TWO PRINCIPLES OF REPAIR TOO OFTEN NEGLECTED BY THOSE IN CHARGE OF GREAT VAULTED CHURCHES AND OTHER BUILDINGS

The Society for the Protection of Ancient Buildings has noticed certain tendencies when the structural defects of vaulted churches are in consideration or are being treated. These indicate that the causes of the defects are sometimes not appreciated.

The following paragraphs draw attention to two matters relating to this subject—namely, to a chief cause of the gradual development of cracks and other signs of movement, and to the economics of repair work. Neither of the considerations discussed below are always laid before the governing bodies by their architects, and sometimes even may not have been fully considered by the architects themselves.

One result of the treatment of defects without taking these matters into consideration is that unnecessarily large sums may easily be spent, another is that the buildings are apt to loose something of their intrinsic character, even if no change is made in the visible form or in the kind of material originally used.

Mr. William Harvey in writing about the movements which take place in buildings spoke much of "drift." By this word he meant the constant tendency for the upper parts of great arched structures to spread outward. Everyone knows of this tendency, but some do not realise its causes fully, nor do others appreciate that one at least of them can scarcely ever or never be met, and is continuous in its activity. The thrusts of arches have long been understood, but the effect of temperature is not often considered in conjunction with them. In most such buildings the arched system is reasonably balanced and would cause no difficulty were it not for the major disruptive force of changing temperature.

Let us then consider this cause of movement in some such great vaulted church. We will suppose it has a nave, transepts and a chancel, all of them aisled, and at the crossing a central tower. It is founded in earth. In England the earth's surface at a relatively small depth is free from temperature influences. But in the building above the earth, even were it scientifically balanced and counter weighted, arch against arch and solid masses against the vaults, this movement which Mr. Harvey calls "drift" will occur and continue. The chief cause is the irresistible expansion followed by corresponding contraction which occurs in all matter subjected to temperature changes. A properly designed building would stand unmoved but for this force. Such a building as is described expands under heat outward in all directions. It is held almost rigidly by the earth at its feet, but its upper parts are relatively free. Each summer it stretches itself thus unobserved to sight, and each winter it draws itself together. In expansion each unit of the wall—each stone or brick—presses hard against the next. In contraction the wall does not return as a single mass. The extent of the return depends on the strength of the mortar and on the bonding of the masonry—the frictional resistance to movement between stone and stone. Were each stone or brick free to move independently they would each contract separately and the whole would not decrease. In actual fact the decrease in the dimensions in contraction is in part a separate movement in each stone, etc., and in part in the wall as a single unit. Consequent upon these movements fractures take place at intervals, and while the separate stones may tend to loosen, considerable masses of the wall expand and contract individually from fracture to fracture. This state might endure for very long if the fissures did not tend to fill with falling dust, with crumbling mortar, and sometimes to be filled with new mortar or grout. Then when the temperature rises, the expanding masses press against each other by reason of the filled fissures. This movement must be remembered in watching "tell tales." Glass or cement "tell tales" would inevitably fracture across purpose made expansion joints, and do so in like manner when laid across those that are self made. Thus the breaking of "tell tales" does not of necessity mean increasing weakness in the structure.

In such an arched and vaulted building as we are considering, a part of the gravity thrusts is outward, and these thrusts, with the gradual choking of the fissures, help to prevent a complete return to the original state when the contraction due to cooling takes place. The outward spread of the upper part of a building is thus in time an absolute certainty, but the base of the walls in the earth is as stationary as that earth.

Further, these movements are not represented by an even expansion and contraction throughout the walls, vaults and arches. The places, where strength is least, break under the stresses and fissures are formed.

These matters should be taken into account in considering repair works. They are not the only ones to be dealt with. Everybody knows that in some mediæval buildings, or in parts of them, foundations were not always fully strong enough for the loads, or were of doubtful strength. Again, parts of a building above ground are found weakened by alterations, or were never wholly balanced. These movements must be treated locally

by the means familiar to all architects. It is our business here to distinguish an active cause or combination of causes from those which are possible, and to consider how to render it or them as little active as is possible. And this work of repair should always be done with a full awareness of the economic conditions prevailing, but the economics of repair are the subject of the second point of this article.

Let us first consider what should be done about the temperature movements which with the thrust of arches is known as "drift."

It might be possible, at least in theory, to secure an even return after expansion by the use of huge tensional rods of steel bound through and about the building and around its ends to keep the units pressed together as they contract; and it might be possible to arrange these so that they are concealed; but in practice it is doubtful whether such a course would *even occasionally* be desirable in a building which is important as architecture, as construction, or as an antiquity. Again the economy of this method may be questioned. Were the method adopted the rods should be inserted so as to be under some strain even when the building is at its coolest. The mediæval device of holding the stones of a spire in position, by a weight hung within, suspended from the apex, is comparable, and there the pressure so imposed is constant in hot and cold weather, and this should be the aim where binding ties are inserted horizontally.

Let us also apply to the whole building a mental test which is useful in considering the repair or even reproduction of its minor parts. Let us ask the question: "Had the original builders purposely made the building with walls leaning as they are now found to do, with arches depressed, and with vaults out of truth, would they have stood any less long?" Mediæval walls are thick; the centres of gravity in them are usually well within the base. A great church built thus out of truth in the twelfth century would be standing so nearly as well to-day as any which was accurately set out and built then, as to make no difference.

From this it follows that there is no reason to fear for the permanence of a building, deformed within limits. If we give it again the strength it first had, it would last as long again. There is no need to give it a greater strength than it first had, and the proof of this is before our eyes—the building has endured for centuries.

This way of judging the needs of a structure may be applied to all its parts, the foundations, the walls and the roofs; and it may safely be said of the bottom on which the weights rest, that they are usually sounder after centuries of pressure than when they were first loaded.

The purpose then of the repair of an old building is to re-establish its original strength rather than to give it a greater strength than it ever had; for that is sufficient.

Often in the course of time, strains will be found to have been added to a building which were not originally present. It may be that old openings or archways have been enlarged, or loads have been added beyond the power of the supports to bear easily. Attention must be given to these. When this is done and the evidence of the actual effect of such changes is being examined, the mental test referred to above may again prove useful.

On more than one occasion roofs have been found which took some of their support from the crowns of vaults, and roofs which by reason of decayed timbers pass their weight to the walls at points and in directions never intended. The object of structural repair should be to re-establish the structure in such manner as will bring loads to the proper points of support.

Wall fractures which have their origin in temperature causes and in early differences in settlement should not be assumed to be "live" nor dangerous; they are sometimes the first but seldom the second. A common example of one such fracture is that which occurs between a spiral stairs in the main walls. Here often, besides the closely jointed newel, the thin walls of the vice are of ashlar. It was difficult, if not impossible, apart from difference in weights, to build the vast rubble and lime mortar core of the main wall in such a way that it would not settle more than the close-jointed stairs turret. Further, thin ashlar walls are differently affected by temperature than are the adjoining masses. Fractures in such circumstances are seldom alarming or serious, and repair is simple. Fractures of comparable import are found where more recent repairs have been made to weight-bearing piers and walls. After, or even during these, readjustment of loads take place, causing some movement and fractures, but when equilibrium is re-established, no other movements but those caused by temperature of necessity occur.

Wall cracks may sometimes be self-made expansion joints and thus, in fact, they serve to some extent the same office as the expansion joints provided in large modern commercial buildings against inevitable climatic movement. Modern methods of repair include the use of fractures, which are due to such movements as expansion joists, reforming them to serve that purpose better.

The economy of repair works also should be considered, and this is the second point of these notes.

Nowadays, for one reason or another, it is becoming the habit of professional advisers only to give advice which will, as far as human power allows, make the building permanently free from all chance of further movement. To do so is seldom the soundly economic course to take, nor is it sensible. If this approach to the matter is considered it will be found wiser to do repairs which will maintain the building for, say, three-quarters of a century, and to invest a sufficient sum, and from the accumulated interest of this sum, to do the like again and again as it is needed. To take an hypothetical example: suppose the "dead permanent" repair to cost £40,000, the probability is that the lesser works could be done for £10,000, and that the interest on another £10,000 would remove from succeeding generations their responsibility for the future maintenance of the

building. Thus a "living permanence" would be obtained for half the sum of the drastic measures which are now commonly recommended to a generous but suffering public.

It was certainly the custom in old days to do only those works which a common-sense, though not so clearly a reasoned, economy prescribed, and *we still have these* buildings with us unspoiled. Indeed, where such economics have been adopted we usually retain more that has the value attaching to ancient buildings than where the newer system has been adopted.

It is of course impossible in so few words to embrace the whole subject, neither could this be done even at the greater length, for the nature of the defects in each building differs. Our object has been to draw attention to two aspects of the work of maintaining ancient buildings which are too often neglected in modern practice.

A. R. Powys, A.R.I.B.A., F.S.A.,
*Secretary, Society for the Protection of Ancient Buildings.*

J. S. Wilson, F.C.G.I., Hon. A.R.I.B.A., M.Inst.C.E.,
*Honorary Engineer to the Society for the Protection of Ancient Buildings.*

Photograph of opening between the cross ribs of the mid-13th-century vault and the wall of Blyth Church, Nottinghamshire. These cracks are interesting examples of the damage caused by temperature thrusts in combination with arch thrusts (the latter probably being responsible for 75 per cent. or more of the movement). The photograph illustrates clearly the way in which cracks, once formed, become filled with rubbish, which prevents any return to the vertical.

The photograph has kindly been lent for reproduction by Mr. Bernard Widdows [*L.*], of Messrs. Sale, Naylor and Widdows [*F.L.L.*], of Derby, who are in charge of the restoration work.

# Public Education in Architecture

*THE EXHIBITION POLICY OF THE R.I.B.A.*

## THE NEED

It is not worth while discussing in the R.I.B.A. JOURNAL the present low standard of public taste in architecture, the ignorance which exists as to the functions of the architect or the benefits that would accrue to a really architecturally-minded nation. All these things are well known to all of us. It is, however, necessary to point out that the need for public education in architecture grows more and more urgent. The days when patronage of building was largely in the hands of an educated aristocracy have passed; even the control exercised by the great landlords in rural areas is disappearing with the break-up of the large estates. Both the patronage and control of building have passed into the hands of the people, in a large measure through their elected representatives, the local authorities. Parliament, by education, health and housing acts, have made the local authorities directly responsible for a large proportion of the nation's building work; by the Town Planning Acts they have given the local authorities close control of all building and made them the guardians of amenities. Every year those powers tend to grow greater. The corresponding need for public education will be realised.

## THE DEMAND

It can also be said that the public as a whole are demanding education in architecture, though the demand is inarticulate and probably unconscious. This is revealed by such signs as the good "press" which all architectural matters receive nowadays in contrast with the apathy of not many years ago. To-day architecture is "news." The remarkably good attendances at the R.I.B.A. Exhibitions, in particular on the present provincial tour of the International Exhibition, is another proof. The public take a very real interest in architecture, though not quite in the way that architects do. The public are not interested in the abstractions and theories of architects; for example, "traditionalism" or "modernism" as creeds leave them cold, though very occasionally the popular press tries to make a minor sensation of these. Purely æsthetic enjoyment of architecture has a certain following, mainly among the educated, as witness the constant stream of visitors both to historic buildings and to new buildings such as the Shakespeare Theatre and the R.I.B.A. Building, though at its lowest this is mere sightseeing.

The real public interest lies in the solutions of modern problems with which the individual is in close contact: the problem of slum clearance; road planning and safety; the preservation and creation of public amenities; the amelioration of working conditions in industry; protection against noise; the buildings for modern education; facilities for recreation and sport (swimming in particular, at the moment). It is undoubtedly this aspect of architecture—an essentially modern one—which has drawn crowds to the R.I.B.A. Exhibitions.

## THE INSTITUTE'S NEW SCHEME

This demand for education and the need for fulfilling it were recognised by the R.I.B.A. Council and led them to set up the Public Relations Committee nearly three years ago. That Committee at once agreed that exhibitions occupied a leading position among the means of education and propaganda at the disposal of the Institute. The Exhibition Sub-Committee of the Art Standing Committee was at that time producing exhibitions (*e.g.*, the Transport and Commercial Architecture Exhibitions) as resources permitted. During 1933 and 1934 the Exhibition Sub-Committee were busy on the preparation of the International Exhibition as part of the Centenary Celebrations, by far the largest exhibition they had undertaken.

In the autumn of 1934 Mr. R. A. Duncan [*A.*], who was a member of both committees, produced a memorandum outlining a scheme for a big expansion of the exhibition system. This was presented to both committees simultaneously and received unanimous approval. The Exhibition Sub-Committee forwarded the memorandum to the Art Standing Committee, who submitted it with their approval to the Council. The Public Relations Committee strongly recommended the Council to adopt it. At their meeting on 15 April 1935 the Council empowered the Exhibition Sub-Committee to proceed with the scheme.

The main outlines of the machinery which, as a result, has been set up are as follows:—

(1) The formation of a new department in the Institute to administer the work controlled by the Exhibition Sub-Committee, with a permanent full-time secretary in charge. Mr. George Marfell, B.A., has now been appointed secretary.

(2) The establishment of a permanent collection of photographic enlargements of upwards of 6,000 photographs with the existing 1,500 of the International and other exhibitions as a nucleus; the collection to be housed in the Library and to be available to members for reference when not on exhibition.

(3) The appointment of a group of voluntary selectors to keep the various sections up to date.

(4) The establishment of working parties for the preparation of drawings, diagrams and lettering to supplement the photographs in the various displays and for use in the catalogues. The recently formed Junior Members' Committee have been asked to undertake this work.

(5) The general principle of working to include the holding of one major exhibition each year in the R.I.B.A. Galleries, to proceed afterwards on tour of the provinces.

(6) The immediate formation of smaller sectional exhibitions and their circulation.

(7) The Public Relations Committee to be responsible for the press work, organisation of lectures, etc., in connection with the exhibitions.

## OPERATION OF THE SCHEME

These ambitious and far-reaching schemes may sound impossible of realisation; but it should be borne in mind that a certain amount of the work has already been done and proved the scheme both possible and effective. The complete programme, it is estimated, will take about three years to come into full operation. Once the initial selection and compilation have been done it will be a comparatively simple matter to keep the scheme and collection up to date. System and adequate card-indexing will enable a great variety of exhibitions to be compiled both quickly and easily and become, in fact, almost a matter of routine.

If it were not for the immense amount of voluntary labour cheerfully and willingly given and the generosity of individual architects in presenting illustrations of their work to the Committee, as well as that of the editors of the technical journals in foregoing their copyright fees, the cost of the scheme would be prohibitive, but actually much has been accomplished with astonishingly small expenditure. The individual architect can help materially and hasten the time when the scheme will be fully effective by presenting—when asked by the Exhibition Sub-Committee—the necessary photographic enlargements of his work. He need have no fear that the trouble and money will be wasted, for not only will the photographs be used for exhibitions, but they will form a valuable adjunct to the Library. The cost of producing a mounted enlargement of the standard size for the collection is approximately 10s.

The sections will be most carefully compiled and the individual architect will only be asked for such works as are essential for representative display. There will be no wholesale requests for photographs and the Selection Committee will endeavour to make their demands as light as possible. It is to be hoped that all British architects will do their utmost to help. Foreign architects have already been most generous in past exhibitions and there is no doubt that many will continue to assist in the same spirit.

It is of equal importance that these exhibitions should be supported by lantern lectures, and it is hoped that a number of volunteers will be found for this work. Lantern lectures will be of especial value for schools. Some centres (notably Bristol) have been able to arrange with the local educational authorities to conduct parties of schoolchildren round the present exhibition and local members have made themselves responsible for giving explanatory talks on modern architecture; the addition of one or two lantern lectures would make these talks of still greater interest.

The cost of the photographic enlargements in the International Exhibition was rather more than £500. It will be clear that the scheme as outlined above cannot work fully unless architects continue to present the photographic enlargements of their work as they did for the International Exhibition. It depends, also, on voluntary labour for the large amount of accessory work in selection, hanging, preparation of posters and drawings, preparation of the catalogues, etc. Finally, some revenue from advertisements in the catalogues will help to cover the inevitable cash payments.

## THE ALLIED SOCIETIES' PART

In order that the scheme should be really effective it is essential that the Allied Societies should take an active part. Hitherto the Exhibition Committee have for the most part dealt directly with local museums and art galleries whose premises are usually the most suitable buildings in a town and are often the only buildings for which payment is not required. Some Allied Societies have been quick to seize on the opportunity presented to them by the visit of an R.I.B.A. Exhibition to their area; others have neglected it. The work that can best be done by the Allied Societies is as follows:—

(1) When a major touring exhibition visits their area to offer their services to the authority (museum or art gallery) holding the exhibition. Their members can assist in hanging, talking to press representatives at press view day, arranging lectures and talks during the run of the exhibition, and acting as guides to parties of schoolchildren and others.

(2) They can suggest useful centres in their areas for future exhibitions either large or small or having a special interest. Schools and institutions will often take small exhibitions if approached. The Allied Society can do this "contact" work and forward to the R.I.B.A. particulars, if possible with drawings, sketches or dimensions of the halls and hanging space available.

It is very important to know the possibilities of the various centres and the general attendances which an exhibition normally obtains. It is often found that those centres which are keen to have an exhibition have quite inadequate accommodation for hanging it. To avoid this, the Committee are compiling a set of plans of the various art galleries, so that they may readily judge the accommodation and offer an exhibition of a suitable size. This will avoid much waste of time and money. There are obviously centres where exhibitions are wanted,

where space is available and the public keen, and these are the places which R.I.B.A. Exhibitions must visit first. Diffident areas can be aroused to interest later, when the scheme has been in operation for a little time. In pursuance of this policy, therefore, Allied Societies will be kept fully informed of the proposals for their district, asked to make suggestions and called upon to give the maximum amount of practical support.

(3) It is intended in future to suggest to Allied Societies that they try to arrange small sections of local work which would fit into a large touring exhibition.

## EXHIBITIONS AS A MEANS OF EDUCATION

The reasons why exhibitions are such valuable means of propaganda and education are worth discussing. The Prince Consort, a man of vision, first conceived the idea of an exhibition as a public educator as well as for sale propaganda. The need to tell people at that time what was happening in their world was very urgent. The great exhibition of 1851 must have led to the enlightenment of multitudes. Since those days the number of exhibitions has increased enormously and their importance has been fully recognised, most notably by the Gorell Committee on Art and Industry which reported in July 1932 and which recommended the appointment of the present Council for Art and Industry. To-day they range from the small specialised and trade exhibitions to great international displays. Some idea of the importance placed upon the latter in particular can be realised from the immense sums nations are prepared to spend on what is largely a matter of national prestige and propaganda rather than of immediate trade benefit. Even large commercial displays like the Ideal Home Exhibition are of considerable educational importance and have far-reaching results. The motor industry and many another sectional interest have been advanced by the competitive display demanded in public exhibitions.

The public are reached, informed and stimulated by exhibitions as they are by no other form of publicity. The R.I.B.A. are frequently asked to supply architectural exhibitions, and until very recently, had neither the power nor the appropriate organisation to enable them to meet these requests. The demand is becoming ever more insistent. To whom should people apply if not to the Institute for information? Even the Government has sought our aid in this matter and in two recent cases—that of the Brussels Exhibition and an Exhibition of Housing (Flats) for the House of Commons—it was fortunately possible to do what was asked.

## EXHIBITIONS *VERSUS* "PUBLICITY"

From time to time the Institute has been urged—often by interested parties—to undertake a campaign of collective advertising as a means of educating the public in architecture and in the services performed by the architect. Such proposals have always been turned down as unworthy of a profession and likely to endanger its freedom and integrity. Large-scale advertising is in any case beyond the financial resources of the Institute. Moreover, self-interested effort merely to provide more work for architects would lower the standing of the profession in the eyes of the public.

Architects have always been altruists. The only policy that the Royal Institute could contemplate is one of service to the nation. A public educational scheme such as is outlined here is that kind of service. That in the raising of the standards of architecture the status of the profession will be enhanced at the same time, is a fact that will be self-evident. It is all a question of the point of view. Mere self-interested propaganda will create enemies and rivals; public service honestly and freely given will bring allies and friends and "these things will be added unto us."

## THE NEXT EXHIBITION

The subject of the next major exhibition to be held at the R.I.B.A. Galleries in the spring of 1936 has been settled. It is to be called "Everyday Things" and its aim is to illustrate the architect's influence in industry, both as designer and as selector. It will be arranged in the following sections: Furniture, Utensils (including ceramics, silverware, cutlery, glass, fittings, clocks, churchplate, etc.), Textiles, Building Equipment, Building Finishes. These sections will consist of actual articles (where practicable), together with photographs, drawings and diagrams. The exhibits will be very carefully selected for quality of design and will consist almost entirely of articles in general production. It is clearly not possible to represent British industry as a whole and the exhibition will be in the nature of a "cross-section."

The personnel of the Exhibition Sub-Committee is as follows:—

H. S. Goodhart-Rendel, chairman.

L. H. Bucknell and R. A. Duncan, honorary secretaries.

M. L. Anderson, E. W. Armstrong, D. L. Bridgwater, N. F. Cachemaille-Day, H. L. Curtis, R. E. Enthoven, J. Murray Easton, Miss Ruth Ellis, E. Maxwell Fry, R. Henniker, G. A. Jellicoe, A. W. Kenyon, Raymond McGrath, S. Rowland Pierce, N. C. Westwood, G. Grey Wornum, F. R. Yerbury, Noel Carrington (co-opted), John Gloag (co-opted), Eric L. Bird (secretary, Public Relations Committee) and G. Marfell (secretary, Exhibition Sub-Committee).

The following have agreed to organise sections in the permanent collection:—

E. H. Allsford, A. F. B. Anderson, L. M. Angus, H. W. Burchett, H. L. Curtis, N. F. Cachemaille-Day, J. Murray Easton, Miss Ruth Ellis, R. E. Enthoven, G. A. Jellicoe, E. R. Jarrett, A. W. Kenyon, A. Minoprio, Guy Morgan, R. Moira, Verner O'Rees, Brian O'Rorke, L. G. Pearson, S. Rowland Pierce, J. C. Shepherd, L. S. Slaughter and N. C. Westwood.

The following have undertaken to organise the various sections and to assist with the next exhibition entitled "Everyday Things":—

M. L. Anderson, E. W. Armstrong, Mrs. Stephen Bone, David Booth, Mrs. David Booth, L. H. Bucknell, Mrs. Darcy Braddell, N. F. Cachemaille-Day, R. A. Duncan, Miss Ruth Ellis, R. E. Enthoven, J. Murray Easton, C. C. Handisyde, R. Henniker, G. A. Jellicoe, E. Maxwell Fry, A. W. Kenyon, John Grey, H. S. Goodhart-Rendel, Mrs. S. Rowland Pierce, G. Grey Wornum, Mrs. G. Grey Wornum and F. R. S. Yorke.

# Review of Construction and Materials

*This series is compiled from all sources contributing technical information of use to architects. These sources are principally the many research bodies, both official and industrial, individual experts and the R.I.B.A. Science Standing Committee. Every effort is made to ensure that the information given shall be as accurate and authoritative as possible. Questions are invited from readers on matters covered by this section; they should be addressed to the Technical Editor. The following are addresses and telephone numbers which are likely to be of use to those members seeking technical information. There are many other bodies dealing with specialised branches of research whose addresses can be obtained from the Technical Editor. We would remind readers that these bodies exist for the service of Architects and the Building Industry and are always pleased to answer enquiries.*

*The Director, The Building Research Station, Garston, Nr. Watford, Herts. Telegrams: "Research Phone Watford." Office hours, 9.30 to 5.30. Saturdays 9 to 12.30.*

*The Director, The Forest Products Research Laboratory, Princes Risborough, Bucks. Telephone: Princes Risborough 101. Telegrams: "Timberlab Princes Risborough." Office hours, 9.15 to 5.30. Saturdays 9.15 to 12.*

*The Director, The British Standards Institution, 28 Victoria Street, London, S.W.1. Telephone: Victoria 3127 and 3128. Telegrams: "Standards Sowest London." Office hours, 9.30 to 5. Saturdays 9.30 to 12.30.*

*The Technical Manager, The Building Centre Ltd., 158, New Bond Street, London, W.1. Telephone: Regent 2701, 2705. Office hours, 10 to 6. Saturdays 10 to 1.*

## THE HOUSE LONGHORN BEETLE

### A NEW PEST OF SOFTWOOD STRUCTURAL TIMBERS

By E. A. Parkin, M.Sc., D.I.C., *Entomology Section, Forest Products Research Laboratory*

Most architects are familiar with the damage done to old structural timbers by the Death-watch beetle and the Common furniture beetle and a few have had experience of the depredations of *Lyctus* Powder-post beetles in the sapwood of certain recently seasoned hardwoods. The purpose of this note is to bring to the notice of architects concerned with repairs to buildings the possibility of the presence of another wood-borer, the House Longhorn beetle, *Hylotrupes bajulus*. Several instances of damage by this insect to seasoned softwood roof timbers have been investigated during the past two years by the Forest Products Research Laboratory. In two of these cases damage was so severe as to necessitate complete renewal of the roof timbering, whilst in others partial replacement and insecticide treatment had to be carried out. Two of the seriously damaged houses were built about 1910 and 1770 respectively, so that the age of the timber seems to have little bearing on its liability to attack.

The beetles, which emerge from infested wood during July and August, are ½–1 inch long, black with two transverse bands of grey hairs on the wing covers and have two smooth shining black prominences on the prothorax (first body segment).

The eggs are laid in cracks and crevices in the wood and the young larvæ which hatch out proceed to tunnel through the wood until fully grown some 4–5 years later. The larvæ are typical Longhorn grubs, white, fleshy, markedly wrinkled and ¾–1¼ inches long when mature. They bore long tunnels which are packed with bore dust and fæcal pellets: the tunnels usually run just under the surface and in the sapwood, but heartwood is not immune from attack. The exit holes, through which the beetles have emerged, are oval, normally measure about ¼ × ⅛ inch and often have a number of loose splinters round the edge. Timbers showing little sign of injury superficially may be found to be badly damaged internally once the surface skin of apparently sound wood has been removed.

The House Longhorn occurs in many European countries and is particularly important in the Baltic region. Fifty years ago this beetle was not common in Denmark, but it was estimated in 1931 that nearly a fourth of all the buildings in that country were then infested, and it is stated that, during that year, about £17,000 was spent in control. It is pointed out, furthermore, that only a small proportion of the buildings infested receive treatment.

There is no doubt that the beetle can breed successfully in seasoned softwood structural timbers in England and, indeed, that it has settled down to do so in a number of buildings over a wide area. In view of the quantities of softwoods which are now used in house and other constructional work, the possibility of the House Longhorn spreading and causing extensive damage in this country must be borne in mind. *Should architects in charge of repairs to buildings observe any insects or damage which appear to correspond to the descriptions given above, they are requested to send what information they can, together with specimens, if obtainable, to the Director, Forest Products Research Laboratory, Princes Risborough, Aylesbury, Bucks.* The Laboratory is anxious to determine to what extent *Hylotrupes* is injurious to softwood structural timbers and its distribution in this country, and can do so only with the co-operation of architects, builders and others, who are frequently examining woodwork in buildings.

# METHODS OF JOINTING COPPER PIPE

Copper piping has been in regular use in this country for very many years in areas where plumbo-solvent or corrosive water supplies have militated against the use of lead or iron. Recently its use has spread all over the country. This is due to two factors: the stabilisation of the price of copper, consequent on the introduction of new production methods and new sources of supply, at a figure low enough to make it competitive with other metals; development of jointing methods reducing both cost and quantity of the material used, as well as of labour for fixing. In the majority of cases the cost of a finished installation will be less in copper than in lead and little, if any more, than in iron. Copper tubing is also beginning to be used extensively for gas supplies and electrical conduit. In these it does its work far better than do the usual methods and materials.

Until recently the traditional method of jointing copper piping was the screwed joint, similar to that used for iron or steel pipes in water services. This necessitated the use of pipes of sufficiently heavy gauge to allow for the amount of tube wall cut away in making the threads for screwing. Such pipes, other than at the threads, were unnecessarily strong for the pressures common in water service work. It was realised that comparatively light gauges could be used with a joint which did not diminish the thickness of metal at any point in the tube.

The first type of joint developed was the *compression fitting*. Later, developments in the technique of welding led to *welded joints*. Recently *capillary joints* (otherwise known as *sweated* or *soldered*) have been introduced from the Continent and America, and some new types developed. Finally, *weldable* fittings, combining in some ways the principles of both the capillary and welded joint, are a still more recent development for use in certain details of an otherwise welded installation.

All the systems have their comparative advantages and disadvantages and also their appropriate applications. It is almost impossible to indicate relative costs, except in very general terms, because selection of system depends largely on such factors as the size and layout of the job, suitability of method to purpose, susceptibility of the job to repetition work, availability of specialised labour, etc.

## SCREWED JOINTS

These are still sometimes used for industrial purposes where very high pressures require the use of heavy gauge tubing. The joint is made with brass unions, solder and fine screw threads, the last to avoid the use of wastefully thick tubing. For normal building work, however, it is unnecessarily costly.

On the Continent there is available a system for producing threads by rolling, which displaces the metal instead of cutting it away, but this has not yet been introduced into this country in the building trade.

## COMPRESSION JOINTS

In this method, now well known and much used, connections between tubes are made with special fittings which by means of screw threads grip the tubes. The twenty or so systems of compression joint on the market may be divided into two main groups: (A) those in which the tube end has to be shaped, usually to fit over a cone-shaped connecting piece (Fig. 1); and (B) those in which the tube is merely cut square to the correct length, a tight joint being made by an annular grip on the outside (Fig. 2).

There is very little to choose between the various systems of compression joint; the numerous makes approved by the leading water authorities, particularly the Metropolitan Water Board, can be safely specified. Those in the second class (B) sometimes constrict the tube diameter slightly at the fitting; those in class (A) require rather more labour in installation.

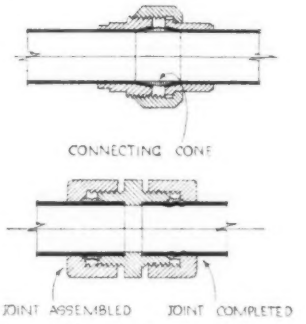



*Fig. 1 (above), Fig. 2 (below).—Examples of the two main types of compression joint*

The chief disadvantage of all types of compression joint is the relatively high cost of the special fittings, particularly in the larger diameters. For large scale plumbing systems, particularly where there is a good deal of repetition, they are likely to be more costly than welded joints. Their great advantage is the ease with which they can be installed, the fitter requiring little more than a spanner and hacksaw and a degree of skill far less than that for installations in lead or iron. Nevertheless, they require care and intelligence in cutting the tube and screwing up if leaks are to be avoided; occasional cases of failure can mostly be traced to careless workmanship in making joints and to faulty layout in which allowance has not been made for the expansions and contractions of long, straight lengths of tube.

All compression joint systems can be easily dismantled for repair or extension; on the other hand, exception is sometimes taken to their appearance as being clumsy and their bulkiness is a disadvantage in confined spaces.

## WELDED JOINTS

The recent advances in the technique of copper welding have made this a practicable method of jointing tubing for plumbing (particularly sanitation), gas services and electrical conduit. A fairly full description was given in the R.I.B.A. JOURNAL of 2 June 1934. Briefly, there are two types of welded joint: (A) *autogenous*, in which the oxy-acetylene flame is used to melt the metal itself or a filler-rod of similar composition; and (B) *bronze welding*, in which a filler rod of a metal having a lower melting point is used (Fig. 3).

There is little to choose between the two methods though bronze welding is usually preferred in water service and sanitation work because it requires slightly less skill; or, in other words, with *in situ* work in awkward positions there is more certainty of making a sound joint.

Welding possesses so many obvious advantages that, although it has been perfected only within about two years, it is already being extensively used. The advantages are: no special fittings are required; joints are made very rapidly; the joints are as strong as, and in some cases stronger than, the tube itself; weight and space are saved; the appearance is neat.

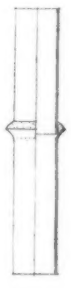


*Fig. 3.—Part elevation and part section of a bronze-welded joint. The space between the upper pipe and the belled-out end of the lower pipe is fed from a bronze filler-rod in the heat of an oxy-acetylene flame*

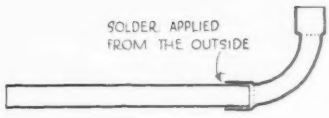



*Fig. 4.—A typical capillary joint of the kind in which solder is applied from the outside to fill the clearance between the tube and the fitting*

Against these points the following must be offset: the transport and manipulation of the cylinders of oxygen and acetylene make it more suited to bench work than to *in situ* work; consequently it is cheaper with schemes in which there is a good deal of repetition work (*e.g.*, hotels, flats and office buildings) that can be done on the bench on mass-production lines; with *in situ* work the great heat of the flame prevents its use near combustible materials; the supply of skilled welders is as yet limited, though most of the large plumbing firms are alive to the necessity of employing them; not all Local Authorities are as yet permitting the use of copper pipe welding; in making connections to other metals such as with tanks and sanitary fittings, other methods must be used.

## CAPILLARY OR SOLDERED JOINTS

Although only recently introduced from abroad into this country, capillary joint systems are having a rapidly increasing sale. In principle they depend on the facility with which melted solder can be drawn between two closely fitting surfaces by surface tension ; that is to say, if a liquid is introduced between two surfaces that are close together it will spread between those surfaces in any direction, even against the force of gravity.

All capillary joint systems require special pre-fabricated fittings (tees, elbows, junctions, etc.) into which the tube ends fit easily but closely. The variation between systems lies in the method of applying the solder to the space between the tube and fitting. In one it is applied from outside (Fig. 4); in another through a small hole in the fitting; in a third the solder is already contained in an annular groove in the fitting (Fig. 5). Heat, applied by a blowlamp, melts the solder which is then drawn into and around the space between the tube end and the fitting. It does not seem to matter what the position of the joint may be, the solder being drawn upwards, downwards or horizontally with equal facility. The tin constituent of the solder has the property of taking copper into solution, thus forming a tin-copper compound which gives an intercrystalline penetration of the two metals.

The work of making a joint is as follows: the tube is cut squarely and to a length that will ensure its fitting fairly closely against the internal shoulder in the fitting (though this is not essential), the burr left by the hacksaw being removed with a file; the meeting surfaces are then thoroughly cleaned; a flux is then applied to the tube end and inside of the fitting; the blowlamp is then applied, with the solder in the form of wire if this is not already contained in the fitting; the appearance of solder as a ring round the edge of the fitting in the self-soldering type, shows that the joint is completed.

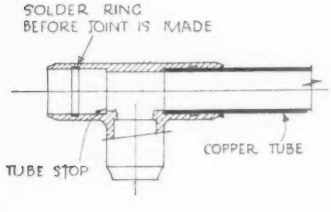



*Fig. 5.—Capillary joint system in which the solder is pre-fabricated in annular grooves in the fitting, requiring only application of the blowlamp to complete the joint*

Tests for resistance to pressure, alterations in temperature, tensile stresses, vibration, etc., have given good results. The advantages are clearly speed in assembly, economy (the fittings are relatively inexpensive), simplicity both in the tools required and in skill of the fitter, neatness of the finished work. Joints can be made with the self-soldering type in positions very difficult of access, because, after the tubes and fittings have been fluxed and placed in position, all that is required is application of the blowlamp which can if necessary be used at arm's length. Failure of a joint will be due to faulty workmanship, that is, the tube may be cut too short to fit far enough into the fitting or, more usually, the surfaces to take the solder may be not properly cleaned, thereby preventing the flux from spreading the solder to all parts of the joint. Careless workmanship with those types to which solder is fed may result in blobs of solder entering the bore.

A somewhat similar system in use on the Continent avoids special fittings, the joints being made between tubes fitted one into the other. Special tools are required for expanding or contracting the tube ends and a higher degree of heat is needed to fuse the harder jointing composition favoured there.

## WELDABLE FITTINGS

This joint can be regarded as being in some ways a combination in principle of the welded joint and the capillary joint. Pre-fabricated copper fittings are used with an internal annular groove into which bronze welding is built up with the use of the oxy-acetylene flame and filler rod. The joint is assembled in much the same way as a capillary joint.

The advantages are very much the same as those of the capillary joint, but the finished work is stronger, as a truly homogeneous joint in copper is formed. The system has the disadvantage of requiring a welding outfit instead of a blowlamp. It would seem, therefore, to offer the best use as a supplement to welding proper; that is, in a system having the simpler joints made with straightforward welding, it could be used for making the more complicated joints and also those with brass (*e.g.*, stopcocks). An installation in which both methods, welding and weldable fittings, are employed with the more suitable method chosen for each joint, may normally cost less than one which is wholly jointed with weldable fittings.

## COSTS

It will be obvious that comparisons of cost are almost impossible to make. Much depends on the size and layout of the job; the familiarity of local plumbers with one method or another will be an important factor; moreover, the newer systems have not as yet had time to become anything like universally known in the plumbing trade. It can be said, however, that for large installations involving repetition work and particularly one-pipe soil and waste systems, bronze welding (with possible occasional use of weldable fittings) is likely to prove more economical than any other method either in copper or other metals.

*The fittings and materials of the types referred to in the above notes are, in the main, readily available in commercial supply, and the methods are generally well within the scope of the average plumbing or other appropriate contractor. The number of plumbing firms equipped to undertake copper welding is also rapidly increasing.*

*We are informed by the Copper Development Association, Thames House, Millbank, S.W.1 (Telephone : Victoria 3912), that they will advise architects, without charge, both on general uses of copper and on specific cases of copper pipe work; they will also supply the names of manufacturers and, where possible, of plumbing firms who undertake copper pipe-work in different parts of the country.*

# Book Reviews

## TECHNICAL COLLEGE BUILDINGS*

The highest compliment which the reviewer can pay to the authors of the report entitled "Technical College Buildings" is to state that their work is so useful and so comprehensive that it should find a place in all libraries where architecture is represented.

It is gratifying that the Institute should be in a position to share the honours which should accrue from the obviously considerable labour which the report's compilation has involved. The Committee responsible was drawn from the Association of Technical Institutions and the Association of Principals of Technical Institutions, assisted by representatives of the Institute of Builders, a member of the staff of the Board of Education, and representatives of the Royal Institute. This all-round representation ensures that the report has been viewed from every angle.

Its purpose is to give guidance on the planning and equipment of Technical College buildings; but the discussion also covers questions of design and materials, indicating the results of present-day experience and experiment rather than attempting to dogmatise or lay down definite procedure. The authors are obviously men of sufficient breadth of view and practical ability to have realised that the problem of which they are treating remains fluid and unsolved like most other problems of architecture. They confine themselves to discussion of alternatives and sound observation; and in doing so save for the teaching profession and architects a great deal of sifting and research. Present-day knowledge is tabulated, and the resultant book is one which, after absorption, leaves the designer with a basis of knowledge and fact as a point of departure for his own creative contribution to the subject.

In order that the field of possibilities should spread beyond English confines, particulars and illustrations are included of some of the most successful colleges on the Continent; and where there are points of foreign practice which might well be considered here they are explained and presented for consideration. But the report is in no sense propaganda for any school of thought, and on the controversial question of design generally it merely offers a gentle hint in making the following very sound suggestion: "While technical college buildings should not be devoid of architectural interest, it is possible to obtain a dignified effect in a simple manner by relying upon skilful composition and the judicious employment of modern materials, rather than upon the more elaborate decorative forms associated with past architectural periods. It will be obvious that a considerable saving will be effected by adopting this suggestion."

The Committee has shown its appreciation of good planning by laying out their report in five sections, thus avoiding redundancy and making reference easy and effective. The headings are: (1) Important General Features of Buildings; (2) General Accommodation; (3) Departmental Accommodation; (4) Technical Colleges in Great Britain; (5) Technical Institutions on the Continent. There is also a bibliography, and an appendix gives lists of publications where plans can be referred to.

In Section I there is no attempt to make a very exhaustive study of the possible alternatives in the matter of structure, probably because opinion on this question is by no means unanimous. Reinforced concrete is hardly mentioned; but in truth such subjects would require a separate volume. One hopes, however, that some day a report on materials and structure alone may become available.

Among the points of interest to architects who have visited foreign schools is mention of the necessity for some sort of exhibition space; English schools are deficient in that respect. On the Continent, where no special exhibition hall is provided, use is made for the purpose of the entrance hall and the specially wide corridors.

Adequate study of blackboard requirements, the desirability of separate staff rooms, the problem of cloakrooms, stand out as features in which practice varies here and abroad. In the most modern Continental schools the blackboard question is often solved with considerable elegance, not only for the teacher but for pupils; teachers have rooms not only for their administrative work but for the practice of their craft; cloakrooms are often supplanted by individual lockers in the corridors, which the report deprecates. Yet when this system is adopted in conjunction with the double partition between classroom and corridor there seems much in its favour; at least it encourages habits of order and neatness and avoids sudden congestion in cloakrooms of limited dimensions. Readers of the report will inevitably draw comparisons between the architectural handling of the problem of schools in England and on the Continent. It is quite evident from the illustrations given that architects in this country have quite recently brought school design into the higher levels of artistic achievement; nevertheless the cultural quality, particularly in the interiors, is still deficient in this country, and detailing is cruder than in the best of the foreign examples.

**Report of the Joint Committee on Technical College Buildings.* Committee of the Association of Technical Institutions and the Association of Principals of Technical Institutions. 1935.

Volumes such as this report do a great deal to help surmount existing shortcomings; by calling attention to the best work abroad they stimulate a competitive ambition. The final result will probably be a consolidation of our present architectural progress, with the gradual introduction of a finer quality in design offering a better presentation of the very sound practical solutions of which English architects undoubtedly possess the secret.

HOWARD ROBERTSON [*F.*]

## BUCKINGHAMSHIRE REGIONAL PLANNING SCHEME

REPORT PREPARED FOR THE BUCKINGHAMSHIRE PLANNING ADVISORY COMMITTEE. *By W. R. Davidge, F.R.I.B.A. Buckinghamshire County Council. 1935. 10s. 6d.*

This report is valuable to all concerned with planning and development in the county. There may be matters that we should have liked to see more fully dealt with and others given less attention, but we shall all be grateful to the County Council and its Planning Advisory Committee for the publication, and to Mr. Davidge for the immense amount of trouble he has taken to produce so comprehensive a study.

The county with its varying topography and geology forms an immense problem for a regional plan. The control of development advocated should be more easily accomplished if the facts given and inferences drawn in the report are fully appreciated.

The figures given relating to loss of farmland are appalling. In ten years fifteen thousand acres have gone out of cultivation, of which some three thousand acres have gone into the category of rough grazing. Much more land is being put on the market for building than is warranted by the demand. This is a two-fold evil, because not only is the land unoccupied or uneconomically used, but false values are created.

Mr. Davidge traces the history of planning and the part played by the county council. Realising the need of a master plan they have made it possible for districts to be properly related, and have fostered the formation of Joint Planning Committees.

The framework for the whole county has been drafted, leaving the details of the area schemes to be filled in. Traffic suggestions are sound, no extremes are advocated and the preservation of amenities is considered.

The objects of planning are clearly set out and emphasis is laid on the fact that planning should ensure that any building development is "an addition to the amenities and not detrimental to those that exist."

Part one ends with a warning that the plan is only the background; the beginning only of a policy to ensure proper development.

The report recommends that environment should be considered. Merely to preserve a building or a plot of land is wasted energy. Mr. G. K. Chesterton, in a letter to the writer concerning the care needed in dealing with roads near The Friends Meeting House, describing his fear of the effect of wide fast-traffic roads, said "A place ceases to be a place when it becomes a place you go through to get to another place."

Roads occupy seventy pages of the report. This may be out of proportion considering that roads are only the framework of the plan. However, the county is the primary authority in this respect.

The report is hardly strong enough on the question of road-side protection. The Ribbon Development Act may encourage the county council to take bolder steps.

It appears unnecessary to stress the value of a by-pass to the owner of adjacent land as the report does. Surely this implies building values and ribbon development. Such a policy recreates the problem it is proposed to solve.

The County Council's suggestions concerning road junctions are usefully illustrated, but I wish the report had advocated further encouragement to owners to develop back land by permitting still less expensive estate development roads, provided that forty feet between hedges is reserved.

I regret that the report has not been much stronger on the subject of elevations. All planning authorities should be urged to control fully. Attention might have been called to the existence of the Advisory Panel System recommended by the Ministry of Health.

The Regional Scheme might have dealt with Playing Fields, and the county as a whole should not object to paying for them. Every parish should own a recreational centre.

Lack of vigour is apparent in dealing with use zones. Redundant land should be forced off the market and all boards that defile our county roads should be removed. Green belts round towns and villages should be definitely advocated. Deferred zones are too uncertain.

The report by referring to possible sites for industry would appear to encourage growth in this direction. Let us not extend too warm a welcome to industry. It may deface our greatest asset; witness the illustration facing page 148—an ugly scar in a beautiful landscape.

The control of advertisement should be as rigorous as possible, and in connection with rubbish dumps why not encourage local authorities to establish controlled tipping, turning the reclaimed land into playing fields ?

The illustrations from the C.P.R.E. collection and elsewhere (although cheaply inserted) indicate good and bad development, but the captions might have been more instructive.

The report is admirably arranged in sections and sub-sections, and in each case the conditions that appertain and the powers that exist to deal with them are clearly set forth in a way that makes the report a very valuable reference book.

G. LANGLEY TAYLOR [*F.*]

## THE CLASSICAL THEATRE

THE ROMAN THEATRE AT VERULAMIUM. *By A. W. G. Lowther, F.S.A., A.R.I.B.A. The Marchand Press. 1935. 2s. 6d. net.*

The earliest dramatic performances probably took place in a natural, open-air setting, and later within light structures or enclosures of wood. The theatre of Dionysus at Athens, of the fifth century B.C., shows how the Greeks used a hillside to assist the form of the auditorium, and sufficiently illustrates the general arrangement of the horseshoe plan and the levels of seating, orchestra and stage. The stoa or portico of this example, referred to by Vitruvius, reached a length of 200 feet and gives a standard of scale to the whole structure. Plato implied for it a seating capacity of 30,000 spectators, but this seems an exaggeration. All the greater Attic dramatists, including Æschylus, Euripides, Sophocles and Aristophanes—whose

statues, according to Pausanias, adorned the building—found a setting for their plays in this famous theatre. Numbers of such buildings were provided within and outside Greece, of varying size and excellence—that at Ephesus being, perhaps, the largest with a reputed diameter of 600 feet and a holding capacity of 60,000 persons. The Roman theatre, modelled, in its turn, upon that of the Greeks, introduced variations in arrangement, influenced somewhat by a lessened interest in serious drama and a decided popular preference for gladiatorial and suchlike displays, that often diverted the proper use of the theatre and certainly discouraged the art of the actor. Of the early wooden playhouses, Pliny described one such, in a rhapsody of exaggeration, as the greatest work ever made by the hand of man. This theatre, of Æmilius Scaurus, was of three stages in height, supported by 360 columns, adorned with 3,000 bronze statues, and gave accommodation for 80,000 spectators, yet it was stated to have been built for only a few days' use. Caius Curio, about the same time (58 B.C.), built his back-to-back theatre in wood, that by a pivotal arrangement could be reversed to an amphitheatric form—the *scena* disappearing as if by magic. It seems to have well expressed the general Roman preference for tricks rather than poetry. The theatre of Pompeius the Great was built in Rome, 54 B.C. with other fine structures of the same epoch. It was stated by Pliny to hold 40,000 persons, was several times damaged by fire and altered and restored, as mentioned by Suetonius, and was finally despoiled in the great age of Renaissance building. Canina includes this structure in his conjectural Roman restorations. The better known, and generally contemporary, theatre of Marcellus (so-called) represented Julius Cæsar's attempt to outdo his rival, but, when completed by Augustus, it was dedicated (13 B.C.) to his much-favoured son-in-law. Some authorities attribute the building to Vitruvius. The well-known arcades, visible from the present Via del Teatro, give a good idea of the external scale and character of this ancient theatre—which seems largely to have influenced the architectural treatment of the later Flavian amphitheatre—but nothing remains to show its general planning or how the stage was arranged on the lower side, towards the Tiber. A seating capacity of 20,000 is generally quoted for this building, though Huelson puts it at about two-thirds of that figure. A third Roman example, that of Cornelius Balbus, built near the Ponte Sisto, has quite disappeared, so that we depend largely upon the survey drawings of the elder Sangallo, of which Lanciani gives some particulars, for such knowledge as we have of it. While the interest of the Romans in serious drama, like their artistic capacity generally, must be considered as far below that of the Greeks, it can still be said that they planned their theatres magnificently and generously, and that most of their large towns (as at Verona) possessed them. To a lesser extent this was so in their colonial possessions, and France can show several such—of which that at Orange is a notable instance.

Mr. Anthony W. G. Lowther, in his recently issued little book on the Roman Theatre at Verulamium, draws attention to the fact that in this country we, also, have the remains of an actual Roman theatre. The author's method has been to present to his readers a series of imaginary pictures of the times, in Verulamium, intended to reach beyond the bare discovered facts and enable the conditions of life, and the possible progress and development of the structure with which he deals, to be visualised. Such a method and aim set out attractively what is essentially valuable in the process of archæological research. The situation of the theatre, as it appears on Dr. Mortimer Wheeler's plan of the Roman city, is to the north-east, not far from the forum site and on the line of the ancient Watling Street. Mr. Lowther puts the date of the founding of the building as A.D. 140—the third year of Imperial Cæsar Antoninus Pius—and pictures for us the three main changes he considers to have occurred in the structure down to about A.D. 300. If it was so small as to hold but 1,000 persons (in its later stages rather more) the nature of its use must have varied considerably; for Verulamium never seems to have possessed an amphitheatre. The general argument is much assisted by some admirable photographs and black line illustrations, including plans.

Mr. Lowther has been associated for some years with the researches of Dr. and Mrs. Wheeler at Verulamium, and this vivid sidelight upon Roman rule in England—so admirably combining wide scholarship with concise presentation—cannot but attract those for whom the Classical Age represents still the most effective hunting-ground for what is best in the cultural side of life.

F. R. Hiorns [*F.*]

## A GUIDE TO COPENHAGEN'S BUILDINGS

Studelkort Kopenhavn og Nærmeste Omegn. *Published by Akademisk Arkiteklforening, Copenhagen, 1935. No price.*

The architectural society of Copenhagen has done a thing which is characteristically alert and, we may say too, is typically Scandinavian in producing a small, well written and printed architectural guide to its city. The booklet does and pretends to do nothing more than direct visitors in Copenhagen to the best buildings by giving lists, accompanied by beautifully drawn maps, intended as keys to be used with a bigger map. The buildings are divided into groups according to their types, as follows: Houses (subdivided into flats of five-six storeys, flats of three storeys, small houses in rows and detached houses); public civic buildings, businesses and shops, hospitals, churches, schools, etc., etc. Each section is introduced with a succinct historical and descriptive note in Danish, English and German, and each building is given its address, map reference, date of erection, architect's name and owner's name. The only criticism that can be made is that the English translations are rather crudely phrased, but as the meaning is seldom obscure and the contents of the notes never beside the point the merits of the booklet are hardly affected at all by such a tiny blemish.

Except in the references to houses the guide includes buildings of all dates; only in the housing section is there a limitation set between 1920 and 1935.

Any town in any country might do what Copenhagen has done; it was done by a trade publisher for Berlin in 1931 in rather a different way, but we know of no others. It could even be done for London by some enterprising publisher who would surely find a sale among the increasing numbers of visitors who come here more than ever before wanting to see English architecture, but bewildered by the complexity of London's plan and appalled by the obtuseness of even the London policeman when asked to give guidance to a building whose chief and, may be, only merits are architectural. There is not a single guide-book written and produced for intelligent visitors telling them of the new buildings at the Zoo, Hay's Wharf, Battersea Power Station, Universal House, the Masonic Hospital and all the innumerable good modern buildings in and near London. A London guide would certainly have to be sectionalised into geographic divisions, but the idea of a guide on the Copenhagen model is a feasible one and might well be taken up.

# Accessions to the Library

## 1934-1935—X

INCORPORATING NOTES ON RECENT PURCHASES

(*These Notes are published without prejudice to a further and more detailed criticism.*)

Lists of all books, pamphlets, drawings and photographs presented to, or purchased by, the Library are published periodically. It is suggested that members who wish to be in close touch with the development of the Library should make a point of retaining these lists for reference.

*Books presented by Publisher or Author marked* R.
*Books purchased marked* P.
• *Books of which one copy at least is in the Loan Library.*

### TOWN AND COUNTRY PLANNING

MINISTRY OF HEALTH

*Town and country planning in England and Wales. Notes on the preparation and bringing into operation of schemes under the Town and Country Planning Act, 1932.
pam. 8¼″. Lond.: H.M.S.O. 1935. 6d. R.(2).

CHARTERED SURVEYORS' INSTITUTION

Town planning in England and Wales. List of local authorities and joint executive committees engaged in the preparation of planning schemes, *etc.* pam. 8″. Lond. 193-.

DAVIDGE (W. R.)

Buckinghamshire regional plan. Report prepared for the county [Buckinghamshire] Planning Advisory Committee.
12″×9¼″. 173 pp.+pls. *and* maps. [Aylesbury. 1935.] 10s. 6d. R.

INTERNATIONAL HOUSING AND TOWN PLANNING CONGRESS

1935: London.
* Part 1: Papers and general reports. 9¼″. [Lond. 1935.] R. (2).
Programme. pam. 1935.
Visit of delegates to Liverpool, *etc.* pam. 1935.

SIMON (*Sir* E. D.) *and* INMAN (J.)

The Rebuilding of Manchester.
8½″. xi+173 pp.+4 pls.+iii maps. Lond.: Longmans, Green. 1935. 5s. P.

GREAT BRITAIN: PARLIAMENT—ACTS

Restriction of ribbon development Act, 1935. [25 and 26 Geo. 5. ch. 47.] pam. 9½″. Lond.: H.M.S.O. 1935. 9d. R.

MINISTRY OF HEALTH

Restriction of ribbon development Act, 1935. (Memo. RRD 1.)
pam. 9¾″. Lond.: H.M.S.O. 1935. 1d. R.
[Same.] Local authorities, *etc.* (Circular 1495.)
pam. 9¾″. Lond.: H.M.S.O. 1935. 1d. R.

MINISTRY OF HEALTH

Garden cities and satellite towns. Report of departmental committee. pam. 9¾″. Lond.: H.M.S.O. 1935. 6d. R.

CROYDON, *County Borough*

Civic centre competition—Premiated and commended designs.
ob. 11″×16″. (ii)+37 pls. [Croydon: Corpn. 1935.] *Presented.*

GARDENS

LOUKOMSKI (G. K.)

Les Statues et les fontaines. . .de la Villa Farnèse à Caprarola. Catalogue des dessins et des sanguines par G— L—, *etc.*
pam. 7¼″. Paris: Seligmann. 1935. *Presented.*

SOCIETIES

SCAPA SOCIETY, *etc.*

Annual report. 1934. 1935.

### SOCIETIES (GENERAL)

ROYAL INSTITUTE OF THE ARCHITECTS OF IRELAND

Journal. [Year book.] 1935.

ESSEX, CAMBRIDGE AND HERTFORDSHIRE SOCIETY OF ARCHITECTS

Year book 1936. [1935.]

ROYAL AUSTRALIAN INSTITUTE OF ARCHITECTS

Year book 1935.

NATIONAL BOOK COUNCIL

Subject index of N.B.C. book lists . . . to . . 1935.
10″×8″. 1935.

ROYAL INSTITUTION OF GREAT BRITAIN

Proceedings. Vol. xxviii. pt. iv. No. 135. 1935.

*DRAWINGS*

INTERNATIONAL EXHIBITION OF HYGIENE, *Dresden*, 1911

British building and interiors. 3 *photographs* (mounted). [19—.]
*Presented by Mr. C. Peyton Baly.*

ELMES (JAMES)

Portrait. James Lonsdale, *pinx.* *Oil painting, c. 1820.*
*Presented by Miss Alice Francis and Miss Ellen Francis.*

LONDON: ST. PAUL'S CATHEDRAL

Morning Chapel, int. ? H. L. Elmes, del. *Water-colour D.* [18—.]
*Presented by Miss Alice Francis and Miss Ellen Francis.*

LONDON TOPOGRAPHICAL SOCIETY

A selection of eight drawings and views of Kensington by deceased artists. From the originals in the collection of the Kensington Public Library. 1934.
pfo. of pls. 14″×11″. [1935.] P. by subscription.

Plan of the parish of Kensington, 1822, by Thomas Starling. (Pubn. for 1934.) *Text leaflet accompanying it:* Notes on plan, *etc.*, by A. Heywood Jones. [1935.]

COLDSTREAM

Bridge. J. Smeaton, archt. T. Morris, Sc. *Engr.* 1766.
*Presented by Mr. J. C. Rogers* [*A.*].

MURRAY (JAMES)

Portrait. *Phot.* [18—.]
Portrait cameo. *Cameo.*
—*Both presented by Miss Janet Murray and Mrs. Knollys.*

DECORATION

Interior decoration. (Unidentified.) 3 sheets. *Colour D.* [17— – 18—.]

Colour decoration, Pompeian and Adam styles. (? Student's work.) (Unidentified.) 6 sheets. *Colour D.* [17— – 18—.]
*Presented by Mr. J. C. Rogers* [*A.*].

PITE (BERESFORD), *del.*

Ratisbon Cathedral: interior.

Design for church (unidentified). J. Belcher, archt. 2 sheets. ext. and int. 3 *Ink D.*
*Presented by Miss E. D. James.*

BELCHER (JOHN)

[Work of.] Drawings, 2 sheets. *Also* Lithographs, 2 sheets; Reproductions, various sheets.
*Presented by Miss E. D. James.*

*MEDALS*

MEDALS

Collection of 64 medals and coins of architectural interest. Originally the property of T. L. Donaldson.
v.d. P. (£5.)

# Review of Periodicals

*Attempt is made in this review to refer to the more important articles in all the journals received by the Library. None of the journals mentioned are in the Loan Library, but the Librarian will be pleased to give information about prices and where each journal can be obtained. Members can have photostat copies of particular articles made at their own cost on application to the Librarian.*

## UNIVERSITIES AND SCHOOLS

WERK (ZURICH). *Vol. XXII. No. 8. August. P. 293, also P. 269.*

Madrid University. A vast scheme of university buildings. The largest and most complete in Europe in the various classes of buildings included.

Machine laboratory of the Eidg. Technische Hochschule, Zurich. A fine modern building seemingly well equipped and planned. Many good illustrations.

ARCHITECTURE ET URBANISME (BRUSSELS). *Vol. LV. No. 4.*

Special number on schools. Good details of equipment, planning and design; well illustrated.

ARCHITETTURA. *Vol. XIV. August. P. 455.*

School at Trento (A. Libera), a modern building adjacent to the Palazzo Salvadori (1700) and the Torre (1200), successfully justifying its modern design in close relation to ancient. Also an Italian school at Casablanca (Paniconi and Pediconi).

## MUSEUMS

ARCHITECT AND BUILDING NEWS. *Vol. CXLIII. No. 3484. 27 Sept. P. 355.*

The Hague Museum. Dr. Berlage's last work.

BOUWKUNDIG WEEKBLAD ARCHITETTURA. *1935. No. 36. 7 Sept. P. 365.*

The heating system in the new Gemeente Museum, Gravenhage.

AMERICAN ARCHITECT. *Vol. CXLIV. No. 2621. Sept. P. 25.*

Seattle Art Museum, Washington (Bebb and Gould). Reinforced concrete, faced stone.

## EXHIBITIONS, ZOOS

MODERNE BAUFORMEN. *Vol. XXXIV. No. 9. Sept. P. 475.*

Buildings for a large horticultural exhibition, Hamburg, in the converted gardens of the old Zoo.

ARCHITECTURAL FORUM. *Vol. LXIII. No. 3. Sept. P. 154.*

New York Zoo (A. Embury and G. Clarke). Good illustrations and details of all types of animal houses.

## LIBRARIES

CONSTRUCTION MODERNE (PARIS). *Vol. L. No. 44. 11 August. P. 950.*

City Library, Toulouse. A vast big-wig building in a rather outmoded style. 645,000 books at present, about 1,000,000 when planned enlargements are carried out.

CLARTÉ (BRUSSELS). *Vol. 8. Nos. 2–7.*

Libraries. Illustrations and descriptions of several large national university libraries, new and old, including the Berne Library; Mazarine Library, Paris; Laurentian, Florence; Cambridge; The Radcliffe Camera, Oxford; Albertine, Brussels and Prague Public and University Libraries. A useful reference.

BAUMEISTER. *Vol. XXXIII. No. 10. October. P. 343.*

Library buildings: article on library planning considered historically; illustrates several good old libraries and the Swiss National Library, Berne.

## BROADCASTING HOUSES

PROFIL. *Vol. 3. No. 8. August, 1935. P. 394.*

Competition designs for a new broadcasting station in Vienna.

## GOVERNMENTAL BUILDINGS

ARKITEKTEN (HELSINGFORS). *1935. No. 7. P. 109.*

Finnish Legation, Moscow. Competition designs: winner, E. Lindroos.

## LOCAL GOVERNMENT BUILDINGS

ARCHITECTURE ILLUSTRATED. *August 1935. P. 36.*

The Guildhall, Kingston-upon-Thames (Maurice E. Webb[*F.*]).

BUILDER. *Vol. CXLIX. No. 4827. 9 August. P. 243.*

ARCHITECTS' JOURNAL. *Vol. LXXXII. No. 2116. 8 August. P. 192.*

Westmorland County Offices, Kendal. Premiated competition design. V. O. Rees [*F.*], 1st premium.

ARCHITECTS' JOURNAL. *Vol. LXXXII. No. 2116. 8 August. P. 192.*

Romford Municipal Offices. Premiated competition designs. 1st premium, H. R. Collins and A. E. O. Geens [*F. and A.*].

## SPORTS AND RECREATION BUILDINGS

BATIR (BRUSSELS) No. 33. *15 August 1935.*

Swimming baths, particularly open-air, sea-front baths in Belgium and France.

BOUWKUNDIG WEEKBLAD. *1935. No. 38. 21 Sept. P. 385.*

Open-air swimming bath, Bloemendaal (G. H. Holt). Large pool 25 by 50 metres and smaller children's pool. Details of cabins, etc., good. Well illustrated.

CONSTRUCTION MODERNE. *Vol. L. No. 47. 29 Sept. P. 1022.*

Stadium—the Stade-Vélodrome du Parc des Princes (Haour and Alymoff); photographs and plans. 450 metres track encircled by stands with full services.

SOVIET ARCHITECTURE. *1935. No. 7. P. 35.*

Gymnasium attached to the Aviochim factory between Leningrad and Moscow; a modern building with covered tennis court and boxing arena, etc. (A. Metline).

ARCHITECTURAL RECORD. *Vol. LXXVIII. No. 3. Sept. P. 165.*

Children's park. "Parque de la revoluçion," Guadalajara Jalisco, Mexico (L. and J. L. Barragan). A well-equipped playground.

## COMMERCIAL AND INDUSTRIAL BUILDINGS

ARCHITECTURAL FORUM. *Vol. LXIII. No. 2. P. 123.*

Ford Company building, California-Pacific Exposition, San Diego. A good and suitably pretentious display of industrial products.

ARCHITECTURAL RECORD. *Vol. LXXVIII. No. 3. Sept. P. 189.*

Office for Editorial Publications, Inc., New York (Howe and Lescaze).

ARCHITECTS' JOURNAL. *Vol. LXXXII. No. 2122. 19 Sept. P. 405.*

Factory administration block, Birmingham. (Bye, Sims and Gifford and S. T. Walker [*A.*]).

## TRANSPORT BUILDINGS

ARCHITECTURE D'AUJOURD'HUI. *Vol. V. No. 8. August.*

Special "Evolution of Transport" number: deals mainly with the design of vehicles.

ARCHITECTURAL RECORD. *Vol. LXXVIII. No. 3. Sept. P. 149.*

Bus terminal station, New York, for Greyhound company (Thomas W. Lamb).

CONSTRUCTION MODERNE (PARIS). *Vol. L. No. 46. 15 Sept. P. 1015.*
Havre, Gare Maritime (Urbain Cassan).

BOUWBEDRIJF (THE HAGUE). *Vol. XII. No. 19. 20 Sept. P. 197.*
Article on the "Caquot" method of airport hangar construction.

## BRIDGES

O.I.A.V. (VIENNA). *Vol. LXXXVII. No. 31 32. 9 August. P. 183.*
The König Alexander I Bridge over the Save near Belgrade. Description of construction.

OPBOUW (AMSTERDAM). *Vol. VI. No. 19. 14 Sept. P. 197.*
Scheme for a high level bridge, Rotterdam. Span between abutments over 750 metres.

## HOSPITALS

WERK (ZURICH). *Vol. XXII. No. 8. August. P. 289.*
Nestlé Hospital, Lausanne (G. Epitaux).

BOUWKUNDIG WEEKBLAD ARCHITETTURA. *1935. No. 32. P. 329.*
Plans, elevations, etc., of a proposed Jewish hospital, Amsterdam, by J. F. Staal.

BUILDING (SYDNEY, N.S.W.). *Vol. LVI. No. 334. 12 June.*
The Mercy Hospital, East Melbourne (Stephenson and Meldrum [*FF.*]).

BOUWKUNDIG WEEKBLAD ARCHITECTURA. *No. 32. 10 August 1935. P. 329.*
Design for an extension to a Jewish hospital in Amsterdam.

## WELFARE BUILDINGS

CONSTRUCTION MODERNE. *Vol. 50. No. 45. 25 August 1935.*
A large orphanage at Beni-Messans.

## THEATRES AND CONCERT HALLS

CASA BELLA (MILAN). *Vol. XIII. No. 91. July. P. 10.*
Competition designs for a vast auditorium in Rome.

OPBOUWEN (AMSTERDAM). *Vol. VI. No. 15. 20 July. P. 149.*
Layout and designs for pavilions, etc., at Bloemendaal aan Zee, a popular seaside resort.

BAUGILDE (BERLIN). *Vol. XVII. No. 16. P. 529.*
Open-air assembly place, Rostock; a semi-circular theatre for assemblies under the Nazi cultural system. Its name, "Thingplatz," is derived from the "thing" or judicial assemblies of early Germanic peoples.

BUILDER. *Vol. CXLIX. No. 4825. 26 July.*
Village Hall, North Creake, Norfolk (Austin Durst [*F.*]).

MODERNE BAUFORMEN. *Vol. XXXIV. No. 9. Sept. P. 464.*
Pump room, promenade and concert hall at Wiessee on Tegernsee (Bruno Brehler).

ARCHITECTURAL RECORD. *Vol. LXXVIII. No. 3. Sept. P. 171.*
New small theatre (775 seats), Oslo, by G. Blakstad and J. Dunker.

## CHURCHES

ARCHITETTURA (MILAN). *Vol. XIV. No. 7. July.*
San Felice Church, Centocelle (M. Paniconi and G. Pediconi). A good modern building.
In the same number are illustrations of designs in a competition for a new façade for San Petronio Bologna.

ARCHITECTURAL FORUM. *Vol. LXIII. No. 2. P. 99.*
St. Joseph's Church, Hindenburg, Germany (Dominikus Böhm), and the First Presbyterian Church, New Rochelle, N.J. (Office of J. Russell Pope).

BAUGILDE. *Vol. XVII. No. 20. P. 645.*
MODERNE BAUFORMEN. *Vol. XXXIV. No. 9. Sept. P. 453.*
Roman Catholic church at Goch am Niederrhein by Josef op gen Oorth. A simple brick building with fine spacious interior.

ARCHITECT AND BUILDING NEWS. *Vol. CXLIII. No. 3484. 27 Sept. P. 361.*
Methodist church hall and school on the Wythenshawe Estate, Manchester (Halliday and Agate [*F. and A.*]).

ARCHITECTURAL RECORD. *Vol. LXXVIII. No. 3. Sept. P. 185.*
Chapel in Pargas, Finland (E. Bryggman).

## DOMESTIC AND HOUSING

ARCHITECTURAL RECORD. *Vol. LXXVIII. No. 2. August 1935.*
Low-cost houses. A competition held by the American Institute of Architects. Site-planning was also judged. P. 102. Moderate-cost house construction and equipment. Also an article on timber house construction, steel-framed houses, steel walls, and building with prefabricated units. Also, articles on the heating and lighting of the small house.

AMERICAN ARCHITECT. *Vol. CXLIV. No. 2621. Sept. P. 69.*
Bathrooms. Useful reference article on planning and equipment.

PERSPEKTIVA. *Vol. 1, No. 5. July 1935.*
A number devoted to the "week-end" house—small, one-or two-story houses used for temporary and holiday residence.

ARKITEKTEN MAANEDSHAEFTE (STOCKHOLM). *Vol. XXXVII. No. 7. August.*
Illustrations and descriptions of several good Swedish housing schemes.

DESIGN AND CONSTRUCTION. *Vol. V. No. 2. Sept.*
L.C.C. Housing. Article with many plans and photos.

ARCHITECTURAL FORUM. *Vol. LXIII. No. 2. P. 89.*
The Economics of Housing in the U.S.: an informative article by Ernest Kahn, once financial editor of the *Frankfurter Zeitung*, and associated with Ernst May in the building of Frankfort's low-cost housing.

## EQUIPMENT

JNL. OF ROYAL ARCH'L. INST. OF CANADA. *Vol. XII. No. 7. P. 116.*
Modern kitchen planning, equipment and finish, by B. E. Parry, F.R.A.I.C.; a useful reference.

ARCHITECTURE (N.Y.) *Vol. LXXII. No. 3. Sept. P. 121.*
New Products, 1934–35. A comprehensive record of equipment and materials.

## CONSTRUCTION

ENTREPRISE FRANÇAISE. *Vol. V. No. 55. July. P. 14.*
The use of glass in building for roofs, vaults and in conjunction with concrete. A useful reference.

ARCHITETTURA (MILAN). *Vol. XIV. No. 7. July. P. 49.*
Radio City, N.Y. Article on planning construction and especially acoustics.

## MISCELLANEOUS

JOURNAL OF NEW ZEALAND INSTITUTE OF ARCHITECTS. *Vol. XIV. No. 2. June. P. 29.*
The Quantity survey system in building contracts. A good historical and practical article by a N. Z. quantity surveyor on his profession and its practice in relation to architecture.

PROFIL (VIENNA). *Vol. III. No. 7. July. P. 325.*
Salzburg. A delightfully illustrated article on the city and its buildings.

# Obituary

## SIR WALTER TAPPER, R.A., K.C.V.O., F.S.A., P.-P.R.I.B.A.

MEMOIRS BY MR. E. GUY DAWBER, A.R.A., AND THE DEAN OF WESTMINSTER

The death of Walter Tapper is a loss to the profession that cannot be filled, for he was one of that fast diminishing group of men who have done so much to uphold the highest standards of English ecclesiastical architecture.

Born in Devonshire, Tapper served his articles with Messrs. Rowell and Sons, of Newton Abbot, and in that beautiful county he there absorbed that love of rural England, its old villages, buildings and churches, that he retained all his life, and though the greater part was spent in London, he was a countryman to the end.

From Devonshire he entered the office of Mr. Basil Champneys, and after a few years there he joined the staff of Messrs. Bodley and Garner, and eventually became their chief assistant.

Here he worked with that group of enthusiastic young men — Edward Warren, F. M. Simpson, A. H. Skipworth, and later Robert Lorimer, Comper and others, who all have upheld in various ways the high tradition of that office.

Commencing practice in Gray's Inn, he removed from there to Melina Place in St. John's Wood, where he remained for many years, until, surrounded by modern flats, he migrated to Westminster, to practise and die in Dean's Yard, under the shadow of the building he loved so well.

Walter Tapper, like all of us in those days, joined the Architectural Association, becoming a member of the Council and Vice-President. In 1889 he became an Associate and in 1912 Fellow of the Royal Institute of British Architects. Here he did loyal service on the Council and as Chairman of the Art Committee, eventually being made President in 1927–1929.

Elected an Associate of the Royal Academy in 1926, he was made a full Academician in February of this year.

He was also a Fellow of the Society of Antiquaries and a member under Rule 11 of the Athenæum.

SIR WALTER TAPPER'S PRESIDENTIAL PORTRAIT BY ORPEN

For some years past he had been consulting architect to York Minster, and on the death of Lethaby was appointed surveyor to Westminster Abbey.

He did much work, both actual and advisory, at Manchester, Canterbury, Carlisle and other cathedrals, and at Balliol and Merton Colleges in Oxford, and has built, added to and renovated a large number of churches, besides domestic work at Farnham Castle, Hengrave Hall and Penshurst, and has designed new houses and buildings all over the country.

For some years past he had been closely connected with the gas industry, and has done a great deal to raise the standard of the design of the buildings and appliances connected with the business; indeed, his work throughout his life has been of a varied kind, though the ecclesiastical side of it has predominated and appealed to him most.

It was without doubt from Bodley's influence that Tapper gained that love of the decorative side of his art, in which he so excelled, for he was a master of the details of the furnishing and adorning of his churches, in colour and craftsmanship, which has stamped his work with a distinction and character peculiarly his own.

Walter Tapper was a man whom it was a pleasure to know, and it was my privilege for many years to be one of his friends. His enthusiasm and vitality was so contagious, his outspoken criticism on all art matters direct and forceful and full of sound common sense.

He hated shams and always sought for truth and beauty in his work, and anything which detracted from it he ignored, and this principle, which he carried with him throughout his life, governed his whole outlook.

He was a great traditionalist, and had but little sympathy with the ultra-modern school, whose work, either ecclesiastical or domestic, made but little appeal to him.

In his own work he carried on the spirit and tradition of the past, but with a freshness and originality of treatment that somehow gave a personal stamp to anything he did, a peculiar characteristic being that all his churches have that devotional atmosphere so often absent from many modern ones. He considered that the mere reproduction of mediæval forms was just as wrong as the studied avoidance of them so persistent to-day.

He was a true artist in every sense of the word, and he loved to surround himself with beautiful things and to entertain his friends amongst them. His interest in all matters connected with his art, I think, got keener as the years went on, and his enjoyment in studying and analysing old buildings and their details, their picturesque grouping or their stately formality, showed that love of the beautiful that lasted to the end of his life.

Walter Tapper spent a great deal of his holidays in Northern Italy, amongst the churches and old buildings of those fascinating hill towns and cities, and whilst he absorbed and saturated his mind with the spirit of their beauty—and traces of this can be seen in some of his work—he never copied and always was his own original self.

To many his work was not sufficiently known, for his was such a modest and retiring nature that he worked only for the love of his art, but buried away in churches and buildings all over the country are exquisite and beautiful examples of his skill, and which should be known to everyone who can admire and appreciate it.

But perhaps the work he loved best of all was that connected with Westminster Abbey—his restoration of Henry VII's Chapel and Torrigiano's Altar Piece, the work in the Library and Muniment Room, and, lastly, the replacement of the old seventeenth century pulpit—and a great deal of other work, which was quietly and carefully being carried out under his supervision and care.

All who attended that beautiful service in the Abbey and followed his ashes into the cloisters on that lovely September morning, with the brilliant sun striking down on the very spot where they lie, will never forget those few words spoken by the Dean:

"In wholehearted thankfulness for the good life and example of a true man, who by lifelong devotion to his vocation and reverent use of his art has helped multitudes of his fellow men to a better appreciation of the Worship of God in the Beauty of Holiness." I think all who knew and loved Walter Tapper could say no more.

E. Guy Dawber.

THE DEAN OF WESTMINSTER writes as follows:—

It would be very easy for me to write a volume on the work done by Walter Tapper at York Minster and at Westminster Abbey. At York the Lady Chapel, the Memorial Chapels of the West Riding Regiment, the West Yorks, the K.O.Y.L.I.; the Chapel of St. Nicholas; the great work of the "preservation" of the Five Sisters' window and 30 or 40 other great windows were all done with Tapper's inspiration and devotion. And at Westminster: Henry VII Chapel (a triumphant achievement); the Muniment Room and Library—one of the finest pieces of modern work in London; the Undercroft; the Chapter House Crypt; the Pulpit in the Choir; the rearrangement of the Transepts; the clearing and "preserving" of the stone work—and 100 other things. But it is for others, with more technical knowledge, to write of the professional side of Walter Tapper's life. Perhaps I may be allowed to contribute a word or two of a more personal nature. He and I were close friends for a great many years, and both at York and at Westminster we worked side by side and I knew him and his ways very intimately. A man's personality comes out in his artistic expression, and Walter Tapper, whatever his technical knowledge and skill may have been, had the first essential of a great Church Architect—a sincere and devotional religious sense. He said to me not long ago that his first aim in all his work was to help other people, if he could, to worship God. And he certainly has done it. There is an indescribable and quite undefinable quality about his work which has a direct and unmistakable appeal to any whose spirit can respond. It comes from a man's life and character and outlook. It is not something that can be put on. It grows with a man and enters quite involuntarily into all his work. There is much talk in these days about self-expression in art. Self-expression is good if the self to be expressed is good.

Coming to those characteristics which one can describe and appraise, I think of him as a man with an uncompromisingly high standard. He would not do a cheap job. If work was to be done, it must be of the very best. He would not cut it down. I have seen his flashes of impatience with the (to him) sordid question of cost: "Money—what's money! This has got to be worthily done, or leave it alone." I remember very well one case in which he was assured by the donors that £600 to £1,000 was all that could possibly be found, and in the end they provided him with close upon £7,000 and a fine scheme was carried out. He had infected them with his own vision. And "vision" was one of his strongest assets. Over and over again the almost fierce light—which his intimates knew so well—came into his eyes as he looked at an untidy corner or a bare wall and flashed out a scheme of what might be done and *ought* to be done. He could *see* it, and that is what so few people can do.

One word I must add of a more intimate nature. Walter Tapper was not merely a very valued leader in his great profession but he was a man and a brother. What more delightful companion—on a golf course, in the billiard room, or by the fire with a pipe.

He had great gifts. An eminent person once said to me, "Why do you ask my advice?—you have got Walter Tapper and he has the finest taste in Europe!" Yes, he had fine taste—good sense—much knowledge—high ideals—a strong will—but over and above all this he had a spirit of love. The love of God and the love of man: the love of his work and the love of his home—these pervaded his life and were very real to him, and, as I look back with happy memory of my long association with him, what stands out is his wealth of friendship and personal affection.

W. F. Norris.

## SIR WALTER TAPPER, R.A.

The following obituary of Sir Walter Tapper was published in *The Times* on 23 September :—

Sir Walter Tapper, R.A., President of the Royal Institute of British Architects in 1927 and 1928, and Surveyor of Westminster Abbey since 1928, died on Saturday at the age of 74.

Though he restored a good many country houses, including Penshurst, Kent, Tapper was almost exclusively an ecclesiastical architect, with Gothic preferences. That he was capable of digesting as well as imitating the style is shown in his most familiar work in London, the Church of the Annunciation, Old Quebec Street, which is an excellent—and early—adaptation of Gothic in brick to the requirements of contemporary worship. Lighted only from the clerestory it has the unusual feature in a modern church of a triforium way above the nave arches, and the larger of the two south aisles almost amounts to a second nave.

Walter John Tapper was born at Bovey Tracey, Devon, in 1861, and served his articles at Newton Abbot. Migrating to London, he presently joined the staff of Messrs. Bodley and Garner, and remained as their chief assistant for a good many years. He set up in practice for himself in 1900, and was soon engaged in restoration work all over the country, besides designing many churches, such as the Church of the Ascension, Malvern Link; St. Erkenwald's, Southend; St. Stephen's, Grimsby; and St. Mary's, Harrogate. At Eton he designed the war memorial in the Lower Chapel. It was, however, in his public appointments that Tapper was best known. He was consulting architect to York Minster and Manchester Cathedral, and at the former, besides being responsible for the repair and preservation of the fabric in general, he designed the screen which, together with the conservation, under his care, of the " Five Sisters " window form the Empire war memorial to women.

In 1928, on the resignation of the late Professor W. R. Lethaby, Tapper was appointed to the office of Surveyor to the Fabric of Westminster Abbey. Well equipped as he was for the office it is questionable if he had Lethaby's grasp of Gothic as a sort of engineering in stone, with every part of the fabric gathered up into a "tense stone skeleton," his enthusiasm being rather for that decorative aspect of the style which Lethaby described as "over-Gothic," and one reason for its decline. Very soon after his appointment Tapper was involved in controversy in connection with the sacristy which it was proposed to erect on the north side of the choir, and for which a full-scale model was for a time exhibited on the site.

Waiving the question of site, which was the chief objection to the proposal, one felt that Lethaby, with his well-founded belief that any addition to a medieval building should be frankly of its own time, would have solved the problem of respect for the Abbey with less imitation of the past in style than Tapper found necessary. The incident brought out very prettily the difference in practical results between the constructional view of Gothic, which was Lethaby's, and the romantic view, which was Tapper's inspiration. But Tapper did very good work at Westminster in cleaning and repair and, as was natural, he found his most congenial opportunity in the restoration, with experiments in colour, of Henry VII. Chapel, completed in 1935. But some of his best work was done by means of a benefaction of £9,000 given by the Pilgrim Trust in 1932 for the alteration to and equipment of the muniment room and library of the Abbey. The plans were, of course, prepared and carried out by Tapper. He connected the muniment room with the library by means of a new gallery placed at the top of the East Cloister. There was a door at the south end of the muniment room which gave access to the roof of the cloister and above that roof was a red tiled loft. By raising the roof one foot, and inserting in it two dormer windows, Tapper produced a pleasant book-lined and panelled gallery stretching the length of the cloister. The east wall of the gallery is also the upper part of the west wall of the library, and Tapper had a doorway constructed in the structure so as to connect the gallery and the library by means of a graceful circular oak staircase. There were several other alterations of less importance. Tapper carried through his whole scheme, which was completed in 1933, with great feeling and regard for the beauties of the muniment room and library, and owing to his skilful planning there was the minimum of disturbance of medieval work.

Tapper, who was an enthusiastic sketcher and measurer of old buildings, made no secret of his reverence for the past, and, though he could appreciate the necessity for new architectural forms, it was clear that his view of "tradition" attached to forms and methods rather than to those principles which can be embodied in the widest departure from the forms and methods of other ages. Thus, in his opening address as President of the Royal Institute of British Architects, in November 1927—he was re-elected to the office for a second year—after insisting, rightly, on the importance of recovering the great architectural traditions which were lost at the end of the eighteenth century, he delivered himself of the doubtful sentences: "Mass production could never produce the best. The pleasing subtleties of the handicrafts went by the board, and no matter how good the design it lost much of its charm in execution by machinery." The loss, of course, is as described; the question is whether that particular "charm" is the essential thing in architecture, the fundamental requirement of the "best." If so, the future of architecture is gloomy indeed.

An energetic man, widely read and full of information, Tapper was elected Associate of the Royal Academy in 1926, and became full R.A. in 1935. This year he was represented in the Royal Academy by a perspective drawing of the Church of the Annunciation, Old Quebec Street, deposited as his diploma work on his election as an Academican, with the implication that he regarded it as his most successful work in architecture. He was created K.C.V.O. in the New Year's Honours.

In 1886 he married Catherine Lydia Jotcham, who died in 1932. They had one son and one daughter.

### *THE FUNERAL*

Sir Walter Tapper was buried in the West Cloister, Westminster Abbey, on Wednesday, 25 September. The Dean of Westminster officiated, assisted by the Abbey clergy.

The pall-bearers were Sir William Llewellyn, G.C.V.O. (President of the Royal Academy), Mr. Percy Thomas, O.B.E. (President R.I.B.A.), Sir Giles Gilbert Scott, R.A., Mr. E. Guy Dawber, A.R.A., Sir Banister Fletcher, Sir William Reid Dick, K.C.V.O., R.A., Sir Goscombe John, R.A., and Sir Edwin Cooper, A.R.A.

Amongst those present were the following :

Mr. and Mrs. Michael Tapper (son and daughter-in-law), Mr. and Mrs. S. Longsdon (son-in-law and daughter), Mr. Serlo Longsdon (grandson).

Canon Alexander, Sir Richard Allison, Mr. Louis Ambler, Mr. and Mrs. R. Y. Ames, Mr. R. H. Ames, Mr. H. V. Ashley, Miss Bailey, Mrs. F. R. Barry, Sir Reginald Blomfield, R.A., Mr. Arthur Bolton (Curator, Sir John Soanes' Museum), Mr. H. Chalton Bradshaw, Mr. Robert W. Cable, Mr. W. D. Caröe, Mr. E. J. Carter (Librarian R.I.B.A.), Mr. E. O. Chadwick, Mr. J. O. Cheadle, Mr. Herbert E. Cooke (representing the Trustees of the Whiteley Homes), Lady (Edwin) Cooper, Mrs. L. Cope-Cornford, Mrs. L. R. Cope-Cornford, Major Hubert C. Corlette, Dr. Costley-White (Headmaster of Westminster School), The Earl of Crawford and Balcarres, Mr. W. I. Croome, Miss V. Cross, Mrs. Guy Dawber, Mr. and Mrs. J. Dewhirst, Mr. H. P. Burke Downing, Mr. C. E. Elcock, Mr. Norman Evill, Mr. and Mrs. Cyril Farey, Mr. Patrick Fleming, Lady (Banister) Fletcher, Mr. Henry M. Fletcher (Hon. Secretary R.I.B.A.), Mr. Robert Foot (also representing Sir David Milne-Watson), Mrs. Lionel Ford, Mr. Edward Ford, Mr. J. Ernest Franck, Mr. F. G. Frost, Mr. S. H. Frost, Lieut.-Gen. Sir William Furse, Mr. Sigismund Goetze, Mr. and Mrs. Curtis Green, Chancellor F. Harrison (representing the Dean and Chapter of York), Major Haskins, Mr. Everard Haynes (R.I.B.A. Board of Architectural Education), Mr. A. E. Henderson, Mr. W. H. Hobday,

Mr. Charles Holden (Vice-President R.I.B.A.), Mr. A. F. Hooper, Mr. Francis Hooper, Mr. Arthur Keen, Sir Edward Knapp-Fisher, Mr. W. R. M. Lamb (Secretary of the Royal Academy), Mr. and Mrs. Courthope Last, Mr. and Mrs. Ernest Last, Mr. Gilbert Ledward, Mr. Sydney Lee (Treasurer of the Royal Academy), Dr. McIntosh, Sir Eric Maclagan (Director of the Victoria and Albert Museum), Mr. E. Maufe, Mr. F. Winton Newman, Mr. David Barclay Niven, Mr. Macbeth Raeburn, Mr. Harry Redfern, Lieut.-Col. H. F. Robinson, Mr. Frank O. Salisbury, Lady Victor Seymour, Mr. A. R. Scott (and also representing Sir Herbert Baker), Mr. C. Oldred Scott, Lady(Gilbert) Scott, Mr. J. Douglas Scott, Mr. H. A. Shepherd, Mrs. Elmer Southwell, Mr. John Spencer, Mrs. John Stephens, Mr. Lawrence E. Tanner, Mr. Sydney Tatchell, Sir A. Brumwell Thomas, Mr. F. W. Troup, Sir Raymond Unwin (Past-President R.I.B.A.), Sir Fabian Ware, Mr. Edward Warren, Mr. W. E. Watson, Mr. Maurice E. Webb (Vice-President R.I.B.A.), Mrs. Douglas West, Mr. and Mrs. Hugh Whitehead, Mrs. Whitehead, Miss Whitehead, Mr. H. Wigglesworth, Mr. Geoffrey C. Wilson, Mr. E. Wimperis, Mr. Charles Woodward (representing the Architects' Benevolent Society), Mr. C. E. Worthington, Mr. Hubert Worthington, and Mr. F. R. Yerbury.

## SIR HENRY TANNER, C.B., I.S.O., F.S.I. [*F.*]

We greatly regret to record the death of Sir Henry Tanner, F.R.I.B.A., who died suddenly on 2 September.

The son of a builder, he was born in London in 1849, and early acquired a knowledge of building operations. After some practical work in Wiltshire and Surrey, he entered the office of Mr. Anthony Salvin, and in 1871 he obtained a post as assistant in the Office of Works in open competition.

For a time he was chief assistant to Mr. Robert Richardson, who had the supervision of post offices for the greater part of London, and of public buildings generally in the southern half of England and Wales.

In 1876 he was transferred to the office of Sir John Taylor, with whom he remained until 1882.

He became, in 1884, a principal architect, and, in 1898, Chief Architect of that Department, retiring in 1913, although his official connection continued for a further two years while he supervised the completion of the new Government office block on the north side of Great George Street, which had been designed by the late J. M. Brydon. During his 42 years' service Sir Henry was responsible for many important Government buildings, among them the Duke of York's School, Dover, and Central Post Offices in Liverpool, Leeds, Cardiff and Birmingham, also the north block of the General Post Office, London. The King Edward Building of the G.P.O., which he regarded as his chief work, is an early example of reinforced concrete construction, of which Sir Henry was one of the pioneers in this country. The west block addition to the Law Courts was another of his official buildings completed shortly before the war.

After the war Sir Henry, in 1919, joined the firm of Messrs. Henry Tanner, which had been founded by one of his sons, Mr. Henry Tanner, F.R.I.B.A. One of the early works of the firm was the rebuilding of Oxford Circus in the general re-development of Regent Street; and they were also architects for many of the other new blocks north of the Quadrant in that thoroughfare. They also designed the Café Royal and the Park Lane Hotel. Sir Henry, who was 86, won the Tite Prize, and became A.R.I.B.A. in 1878, being elected F.R.I.B.A. in 1891. He was a past chairman of the Royal Sanitary Institute, a past President of the old Concrete Institute, and a Fellow of the Institution of Structural Engineers, which developed out of it; also a F.S.I. He received a C.B., the I.S.O., and the honour of Knight Bachelor for his official services.

The first part of Sir Henry Tanner's funeral service was read at the Parish Church of St. Marylebone. Included in the congregation, in addition to members of the family, were: Mr. Henry M. Fletcher, F.R.I.B.A., Hon. Secretary R.I.B.A., representing the Royal Institute; Mr. A. Strachan Bennion (representing Messrs. Gardiner and Theobald, and Mr. John M. Theobald, senior Vice-President of the Chartered Surveyors' Institution); Mr. H. G. Evans (assistant secretary of the Chartered Surveyors' Institution); Mr. F. R. Yerbury (general secretary of the Architectural Association); Sir Edgar Horne, Bt.; Mr. W. Matthews Hill (Higgs and Hill, Ltd.); Mr. R. S. Walker (representing Alderman Sir William Burton); Dr. P. M. Evans (Master of the Clothworkers' Company); Mr. Saxon Snell (representing the Royal Sanitary Institute), Mr. J. A. Flatt (Messrs. Richard Ellis and Son); Mr. W. B. Dukes (Messrs. Henry Tanner), and the staff of Messrs. Henry Tanner, 134 Fenchurch Street.

## PROFESSOR HENRY ADAMS [*F.*]

Professor Henry Adams, consulting engineer and architect, died on Tuesday, 13 August, at the age of 89.

The eldest son of Mr. J. H. Adams, of the North London Railway, and grandson of Mr. J. S. Adams, of the West and East India Docks, he was born on 24 March 1846. He was educated at King's College, London, and at the City of London College. Throughout his college career, in the course of which he received the Queen's Medal, nine prizes, 29 certificates, including two first places in first-class honours in the Science and Art Department, he maintained an exceptionally high standard of academic achievement, and the promise he showed as a student of a distinguished career was fulfilled.

He was in private practice as an engineer and architect from the year 1877. From 1900–1902 he was in practice with Mr. Hal Williams, and after 1909 worked in partnership with his eldest son at 60 Queen Victoria Street, E.C. The chief works carried out by him were wharves, jetties, coal stores, workshops, offices, water supply and sewerage works. He was consulted by architects in connection with steel and reinforced concrete work for many important buildings and in connection with the restoration of many famous old buildings. He retired from practice in 1928.

For thirty-five years he held the post of Professor of Engineering at the City of London College. In addition he was a Chief Examiner (Engineering) for the Board of Education from 1905 to 1910, and he had been a member of the council and chairman of the examiners for the Society of Architects. He was the author of many standard works on building construction and structural work. He was a member of the council and ex-chairman of the examiners for the Royal Sanitary Institute, superintending examiner for the Society of Engineers, and an arbitrator, London Court of Arbitration. In 1925, when the Society of Architects was amalgamated with the R.I.B.A., Professor Adams became a Fellow of the Institute.

His practice is being carried on by Mr. Henry C. Adams, M.Inst.C.E., M.I.Mech.E., E.R.San.I., at 60 Queen Victoria Street, E.C.4.

## ARTHUR LINDSAY HORSBURGH [*F.*]

Capt. Arthur Lindsay Horsburgh, who died at the end of last year, was born in 1893. In 1908 he was articled to Mr. Harry Redfern [*F.*], later becoming his salaried assistant. In 1914 he joined up, served in Egypt, Suvla Bay and Gallipoli; was dangerously wounded at Ypres in 1917 and was invalided home. After demobilisation he worked on housing under the Ministry of Health. He was appointed Assistant Architect, Region E. Midlands Area, Birmingham, and was promoted Chief Architect in 1920, the year in which he set up in private practice at Great Western Buildings, Livery Street, Birmingham. He was appointed architect to Arley Colliery, Ltd., and prepared the lay-out of the estate and house plans for 400 houses, as well as shops, offices, a large hotel, church, and welfare hall. He also designed 300 houses at

Erdington and Northfield, and was the architect of the community assembly hall at Canwell, for Birmingham Agricultural Committee; branch premises for Birmingham Municipal Bank at King's Heath, cinema theatre, Quarry Bank, Staffs, licensed premises at Nuneaton for Messrs. Bass and Co., Ltd., "The Nag's Head" Hotel, "The Swan" Hotel, Armitage, for Messrs. Thos. Salt and Co., Burton, and a good deal of private domestic work in Chester, Aberdovey, Edgbaston, Gerrards Cross, Brighton. In 1921 he was appointed Consulting Architect to the *Daily Mail* Ideal Home Exhibition. Capt. Horsburgh possessed a great knowledge of architectural literature and was a regular contributor to the programmes of the Midland Regional Station of the B.B.C. A friend writes of him that he was "an artist in the broadest sense of the word—at once a designer, musician and writer," and his death was a great loss to a wide circle of friends in Birmingham.

### JOHN BAIN [*F.*]

Mr. John Bain was born in 1868, and died on 17 June 1935. He studied at the Government School of Art, Inverness, and received his architectural training in the offices of Messrs. Ross and Macbeth, Inverness.

In 1893 he won the competition for the Durham Road Schools, Newport, with the late Mr. Alfred Swash, with whom he entered into partnership, practising as Messrs. Swash and Bain at Midland Bank Chambers, Newport, Mon. In 1905 he set up in practice independently and in 1908 he was appointed architect to the Monmouthshire Education Committee, a position which he held up till his death.

Mr. Bain was the architect of various buildings in Newport, including the Liberal Club, the South Wales Argus Offices, the Methodist Free Church in Hill Street, extensions to the Masonic Buildings, extensions to the Museum, and the Higher Elementary School. He was also the architect for Usk Agricultural Institute and for extensive additions to Abergavenny Mental Hospital, the designer of various schools in the country, including Aberbargoed and Bassaleg Secondary Schools, the latter being in hand at the time of his death.

Mr. Bain was elected an Associate of the Institute in 1892 and a Fellow in 1900.

# Correspondence

## NOISE AND HOUSING

*To the Editor*, JOURNAL R.I.B.A.,—

SIR,—Mr. Basil Ward takes me to task for relating the noise problem to certain industrial and economic tendencies in modern building. But he does not deny any specific fact or argument, and if the criticisms in his letter are the only ones he can muster, then he ought seriously to think again. I am not a "specialist," but have always taught that good acoustics is good planning and good building, and conversely that where widespread complaints exist it is a sign of bad planning and bad building. Now modernists, if they are realists, ought to welcome just and stringent criticism. Modern planning for hygiene is a great contribution to human welfare. One recognises in country districts a real improvement in humane conditions due to it. But building specification and technique, on the other hand, is poor, non-qualitative; it shows (in spite of progress trumpetings) a decline, not an advance, in recent years, and its results are now being seen in a considerable failure to give adequate living conditions in dwellings. The danger is that having demolished our slums and replanned well, we shall then build so cheaply and badly that we shall not defend against "the machine" and its associated nuisances. Sleep, and with it health, is threatened. This danger is not an illusion. In the Ministry of Health interim Report on the Construction of Flats for the Working Classes the Committee very wisely begin their measurement of efficiency by saying, "The flats must provide comfortable homes"; and later on, "One overriding consideration is the general habitability of the dwelling." Now it is not a creditable reflection upon architects to remind them that dwellings must be habitable, but it has become very necessary. As I write I have before me Dr. Möller's first article on Insulation for Architects for the R.I.B.A. JOURNAL. In it he quotes the "sad statement" of Dr. Cammerer that in Germany under their huge housing schemes they have built *more than one hundred thousand flats unfit for occupation.* And in the London area at the moment hundreds of flats are being built in which the "one overriding consideration" of habitability so opportunely pressed by the Ministry of Health committee is being ignored.

In my view we are thinking wrongly in two ways. We interest ourselves far too much in engineering standards, and we accept big business and big industry economics as something God-given and inevitable. In regard to the first, the distinction I drew in my paper at the Science Museum between building science and engineering science is of vital importance; but it is not my distinction, it is drawn from the work of the Building Research Station. Engineering science concentrates on safe structure for minimum cost, "and some of the best engineering brains are ceaselessly preoccupied with that problem." But that is not enough. Building science envisages, in addition to safe structures, the problems of protection, long-range durability, quality values, manipulative labour and so on. And the headquarters in Europe of building science is not the laboratories of Berlin or Moscow, or the Bauhaus at Dessau, nor the pages of clever propaganda brochures, but the Building Research Station at Garston. We shall begin to solve our problems when we use the B.R.S., and found our theory upon what it gives us, instead of going abroad for inferior experimental data compiled under different

climatic and sociological conditions. And the building scientist recognises the Mass Law and its implications and recognises it on scientific grounds exactly as he would any other data. He does not turn away from it because it happens to run counter to modern engineering tendencies.

In regard to the second, if a false economic is leading directly to bad work and causing harm to the public it is our duty as a profession to oppose it. It is no excuse to plead, "This is what big business or big industry says is the right thing." What should we think of the medical profession if it said that a particular harmful quack treatment was *inevitable* because it was said to be good business. Big business often means big blunders, as the last five years in America has proved. Here, to-day, is one blunder—that modern flats must pay 10 per cent. dividends first and be habitable only second. Architects, better than any one else, know that if flats had not to pay 10 per cent., then a good massive, sound-proof, properly finished, adequately dimensioned block could be afforded. Here is another blunder—that mass-produced, perishable quality building is good enough for housing the working classes. But what is the use of solving the slum problem now and having a far worse one in thirty years? This concerns us because residential building is our central duty as a profession. The public will hold *us* responsible, not the distinguished engineers and *entrepreneurs* who are always telling us what to do. In modern practice one of the most difficult situations occurs when the client remarks bitterly that if only his architect had warned him he would have spent more money. This often happens in noise nuisance cases, because noise is always connected with cheap building. But it is a sign of the times. As a profession we ought to have the courage to tell the public and the government that cheap housing is wrong and that more money, not less, must be spent on it. If, when warned, we say we can't afford to spend adequately on our most important needs, then the problem has indeed passed out of the technical into the political field where Trystan Edwards has already placed it in his scheme for a hundred new towns.

But I suggest also that those notions of mass production, luxury fittings, perishable quality, machine-mindedness—the ordinary stock-in-trade of modernist journals—are not ideals for architects at all. They have nothing to do with the real *quality* of a civilisation. They are ideas about makeshifts in a transitional age, and as ideas generally boil down to this: "It will last my time." But what sort of a philosophy is that? It is ordinary materialism with a rapid cycle of self-elimination. Upon the "luxury" flat descends the "chic" gas bomb. We ought not to be on the materialist side. We ought to express that humanism which in crisis after crisis in our interesting age is found at grips with materialism.—Yours, etc.,

H. BAGENAL [*A.*].

## TOWN AND COUNTRY (GENERAL INTERIM DEVELOPMENT) ORDER, 1933

*22A Cavendish Square, W.1.*

*To the Editor,* JOURNAL R.I.B.A.,—

SIR,—The letters from your correspondents on the above subject published in the issue of the JOURNAL, dated 7 September, are very interesting, and contain much pertinent comment.

I think, however, that there are two or three further points in the letter from the Clerk to the Council (JOURNAL, 10 August) which are not unworthy of remark.

If the "basic principles . . . must be determined before the proposals are examined in detail," this clearly means that one must first submit sketch plans. After waiting, say, from six to eight weeks for a decision, if one then receives a blessing on one's efforts, one must submit a further and more elaborate set of drawings—involving another long wait. And at the end of this time (say the best part of three months in all) one may *still* get a refusal—on a variety of grounds, viz.: details of planning, elevations, and so forth. (The Council's views on such points may be admirable, but they need not necessarily coincide with one's own.) What alternatives has one then? To appeal, to compromise, or to start all over again; either one of which courses inevitably involves still further delay. Meanwhile, of course, one's clients are becoming impatient, and not without reason.

Again, the Clerk in his letter uses the words, "requirements as are operative." I submit that architects do not know what these requirements *are*, and have no means of finding out, except by the above extraordinarily protracted procedure. One appears unable to obtain access—at any rate in the early stages—to any official who has any *real* authority. Incidentally, it might be noted that the fact that one is verbally informed that all is well, and that a scheme has been recommended for approval" by no means implies that "Consent" will necessarily be forthcoming!

The Clerk also says that block plans reproduced from "out-of-date Ordnance maps" will not be welcomed. Two points occur to me in connection with this: (*a*) that Ordnance maps should *not* be out of date (or certainly not 40 years old, as some of them are); and (*b*) that nowadays architects are frequently employed to submit schemes for the development of sites which their clients *have not yet actually bought*, but are only thinking of buying, *if* a paying development can be made. In such cases clients cannot afford to have accurate surveys made.

No one who has had any business relations with the Council can fail to appreciate the courtesy of their officials, nor to admire the quickness with which they grasp the essentials of a scheme. Neither can one doubt their high ideals. But the truth is that under this Interim Development Order architects are working entirely in the dark. Before (under the Building Act) one could tell a client exactly what could be done with a given site, and what could not. Now one can really only plead blank ignorance.

I am quite sure that the present difficulties can, and will, be straightened out, but meanwhile one cannot help coming to the conclusion that on the "material date" the Council were not ready with their scheme, *and they are not ready now.* They are endeavouring to administer a scheme the "basic principles" and "requirements" of which they have not themselves yet decided (otherwise, as I have said, why do they not tell us in print what they are?) and without having the requisite personnel.

I am, Sir,

Yours faithfully,

ASHLEY F. BENJAMIN [*F.*].

*4 Denewood Road,*
*Highgate, N.6.*

*To the Editor*, JOURNAL R.I.B.A.,—

SIR,—Mr. P. V. Burnett would appear correct in his conclusion that since the application of the Town and Country Planning Act to London, those portions of the London Building Act relative to streets, building lines, air space and height of buildings, have been virtually repealed, and that nothing at all tangible has been put in place.

An architect is no longer in a position to advise his clients concerning rebuilding, development of vacant sites, or even minor works involving any alteration of the external walls of a building without first making application to the council, and he must anticipate at least two months' delay before any decision will be secured, and a further two months' delay should this lead, as is often the case, to an amended application being made, which means loss of employment, loss of rates and only too often loss of clients' goodwill.

It should further be pointed out that the hopeless congestion existing in the Superintending Architect's Department is affecting items quite distinct from Town-Planning, and there are incredible delays in obtaining waivers to the Act and consents for uniting buildings and applications of a similar nature.

Being responsible for a considerable amount of building work in the provinces, I can say emphatically that in no other city in England is one faced with the same difficulties, petty restrictions and delays as is the case in London to-day, and with ground values at their present level it is intolerable to keep clients waiting two or three months to know if plans will be approved by the Town-Planning Committee, who appear to have set their hearts on creating a "lower" London without any indication as to how far in this respect they intend to go.

I agree with Mr. Burnett that the Council's permanent officials, always helpful and polite, are doing their utmost to deal with the hundreds of applications which pour in week by week and I do not think there can be much doubt that it is the Committee System which is at fault, coupled with the Council rushing blindly into Town-Planning of a most involved nature, without any plan at all.

The Council could and should delegate far greater powers to give consent to minor applications to their District Surveyors, and also to the permanent officials, and those applications should not have to wait their turn to come before over-burdened committees, mostly composed of laymen.

It is unlikely that this correspondence or the correspondence which has been going on in one of the daily papers is likely to have any effect upon those responsible at the London County Council, who appear blind to the chaos which exists in their own house, while trying to arrange other people's, and I suggest this is a matter of sufficient national importance for the Institute to take action and bring the present state of affairs to the attention of the Minister of Health, and also before any suitable Members of Parliament who would raise the question in the House.—Yours faithfully, DONALD MACPHERSON [*A.*].

*The Croft,*
*Ashridge Park,*
*Berkhampstead.*

*To the Editor*, JOURNAL R.I.B.A.,—

DEAR SIR,—I read with interest the editorial note in the *Daily Telegraph* on 12 September and the letters in our JOURNAL of 7 September, *re* town-planning delays. Provincial architects share the fate of their London brethren. It is not surprising that building owners and architects chafe under these delays. But the authorities should not be unjustly blamed. The fault is said to lie in the rush from Whitehall to get the Act adopted by various councils throughout the length and breadth of the land without giving the general public fully published details of the provisions of the Act (and plans of the zoned areas) in the local Press for a full six or twelve months before the machinery was set in motion. Even council officials have hardly grasped the momentous changes involved. Endless worry, time and money could have been saved by a little more forethought.

The Act may prove a precarious blessing to architects if it destroys their individuality. All are agreed that future development must be regulated, but not by prescription as to matters of design of elevations from the committees or even their officials. This will tend to make for monotony, especially in provincial street façades.

The charm of the countryside has been imperilled by the speculator. Stereotyped town-planning may be a danger in a reverse direction if carried too far by an authority's dictation.

Liberty of action is a Britisher's privilege. But architects may find this cherished possession leaving them if building owners (as a line of least resistance) take what town-planning committees prescribe for them, and this is already happening.

W. B. STONEBRIDGE [*F.*].

## BUILDING SCIENCE COURSE FOR TEACHERS

*c/o 42 King's Road,*
*Westcliff, Essex.*

*To the Editor*, JOURNAL R.I.B.A.,—

SIR,—The JOURNAL of the 7th inst. contains a report by Mr. Stephen Welsh on the Building Science Course for Teachers held from 22 July to 1 August.

Mr. Welsh's report is an admirable summing-up of the course and one which I am happy to endorse; he will not mind, I am sure, if I draw attention to a small error when he states that among other representatives of University schools present was one from Melbourne—this should read "Sydney."

May I take this opportunity, sir, of expressing my appreciation of the splendid manner in which the work of the course was both prepared and carried out, and of the kindly and courteous manner in which the writer, a stranger, was received by Mr. Briggs and his assistants.—Yours faithfully,

*The University of Sydney.* W. R. RICHARDSON [*F.*].

## GLASGOW CONFERENCE AND MODERN ARCHITECTURE

*Belleville,*
*The Common,*
*Tunbridge Wells.*

*To the Editor*, JOURNAL R.I.B.A.,—

DEAR SIR,—I rather expected a terrific onslaught and heavy artillery to be trained upon me for my criticism of modern design. I am thankful to have escaped with my life.

Mr. Hird has not quoted me with quite strict accuracy. However, I am glad to observe that he does not go to the extreme limit in his espousal of—what may I call it—the new phase?

Indeed, he would almost appear to be halting between two opinions. Anyway, he does admit that some architectural masterpieces have been created in the past, for which I am grateful. This is in contradiction to some bright young modernists who recently blandly described one acknowledged masterpiece of the Victorian era as a monstrosity.

But seriously, I would ask, what is the mind and view of the general public on this subject? and, after all, the layman does count.

As far as one can gather on the whole, it is one of bewilderment, coupled more or less with revulsion.

Take care that in its perplexity and impatience it does not cry "A plague on your architectural phantasies; you don't know your job."

Crudely expressed it may be, but I believe that represents the view of a considerable majority of the lay intelligentsia.—Yours faithfully,

HENRY ELWIG [*F.*].

# Notes

## PRESIDENT'S ENGAGEMENTS

The President is attending a dinner of the Institution of Mechanical Engineers on 18 October, and a dinner given by the N.F.B.T.E. and the Chartered Surveyors' Institution to the members of the Joint Committee on Standard Methods of Measurement on 15 October. He will also attend the dinner of the Institute of Chartered Accountants in England and Wales on Monday, 21 October, at the Guildhall.

## MR. HAROLD HUGHES [*A.*]

Mr. Harold Hughes, M.A., F.S.A., R.C.A., A.R.I.B.A., of Bangor, has been appointed as a member of the Royal Commission on Ancient Monuments in Wales and Monmouth.

## NATIONAL HOUSING AND TOWN PLANNING CONFERENCE

An important national housing and town planning conference will be held at Scarborough during the week-end, 29 November–2 December, under the auspices of the National Housing and Town Planning Council. The conference will be attended by a large number of delegates from local authorities in England and Wales and Scotland and will be addressed by Sir Kingsley Wood, the Minister of Health, and also by other prominent housing reformers and town planning experts.

The principal subjects for discussion will be the administration of the Town and Country Planning Act, 1932, the Restriction of Ribbon Development Act, 1935, and the Housing Acts of 1930 and 1935. In view of the present widespread operations in connection with slum clearance and rehousing, and the forthcoming national campaign to abolish overcrowding, the Conference will undoubtedly be of especial interest.

Full particulars can be obtained from Mr. John G. Martin, Secretary, National Housing and Town Planning Council, 41 Russell Square, London, W.C.1.

## R.I.B.A. DANCE CLUB

The following dates have been arranged for dances at the R.I.B.A. premises for the session 1935–36:—8 November, 13 December, 31 January, 3 April, 15 May, 3 July.

The dances will start at 9 p.m. and finish at 1 a.m. Gerhardi's Band from the Sovrani's Blue Train Restaurant, Piccadilly, has been engaged for the first dance.

The price of tickets will be as follows:—

| | |
|---|---|
| Double ticket for series of six dances .. .. | £2 0 0 |
| Single ticket for series of six dances .. .. | £1 10 0 |

Individual tickets for each dance, 6s. each.

Arrangements for a temporary licence have been made, and drinks may therefore be purchased by members and their guests.

Applications for serial tickets or for individual tickets for each dance must be received at least three days before the first dance—or before the dance for which the tickets are required.

All applications must be accompanied by cheques for the appropriate amount. Any application not accompanied by such cheque will not be entertained, and will not be acknowledged.

Applications by telephone will not be accepted.

All applications for tickets must be sent to Mrs. Alan Slater, 8 Wellgarth Road, N.W.11.

## HOUSING CENTRE LECTURES

Lectures will be given at the Housing Centre, 13 Suffolk Street, S.W.1, at 6 p.m. on the first Mondays and at 8.15 p.m. on the third Tuesdays in each month. Members of the Centre are invited and are asked to bring a friend.

The Tuesday lectures are designed to illustrate the general aspect of the housing problem. The Monday lectures will be of a more technical nature.

The first lecture was given on 7 October by Miss Elizabeth Denby, who spoke on "The Fabric of a New Community."

The remaining Monday lectures are as follows:

4 NOVEMBER.—Rev. Charles Jenkinson (Leeds Housing Committee), *Differential Rent Relief in Practice in Leeds.*

2 DECEMBER.—Miss M. R. Baskett, B.A., *Housing Estate Management.*

The subjects of lectures on 6 JANUARY, 3 FEBRUARY and 2 MARCH will be announced later.

The Tuesday lectures are as follows:

15 OCTOBER.—The Rt. Hon. Sir Kingsley Wood, J.P., M.P. (Minister of Health), *Voluntary Associations and their importance to Housing.*

19 NOVEMBER.—Mr. F. R. Jefford, M.R.San.I., M.S.I.A. (Cheltenham), *Slum Clearance and Reconditioning: The Practical Way.*

17 DECEMBER.—Mr. Kaufmann, Dipl., Ing. (Late Director of Housing, City of Frankfurt, A.M.), *Housing and Territorial Planning in Russia.*

21 JANUARY 1936.—The Rt. Hon. Lord Phillimore, M.C., *Housing in Relation to Employment.*

18 FEBRUARY.—Sir Ernest Simon, M.A., M.Inst.C.E., P.C., M.I.Mech.E., *Manchester Gives a Lead.*

17 MARCH.—Sir Fabian Ware, K.C.V.O., K.B.E., C.B., C.M.G. (Chairman Gloucestershire C.P.R.E.), *The Preservation of Urban and Rural Amenities.*

## THE INSTITUTION OF SANITARY ENGINEERS

On Friday, 25 October 1935, a paper on "Ventilation" will be read before the Institution of Sanitary Engineers at Caxton Hall, S.W.1, at 6 p.m., by Mr. C. B. Jackson, F.I.S.E., M.I.H.V.E.

Members of the R.I.B.A. will be heartily welcomed at the meeting. Further particulars can be obtained from the Secretary, Mr. A. D. Hamlyn, 120-122 Victoria Street, S.W.1.

## R.I.B.A. (ARCHIBALD DAWNAY) SCHOLARSHIPS, 1935–1936

In accordance with the terms of the will of the late Sir Archibald Dawnay, the Royal Institute of British Architects have awarded two Scholarships of £50 for the academical year 1935–1936, one to Mr. N. P. Thomas, of the Welsh School of Architecture, The Technical College, Cardiff, and the other to Mr. L. W. D. Wall, of the Welsh School of Architecture, The Technical College, Cardiff.

Mr. A. M. Graham, of the Edinburgh College of Art, and Mr. H. E. A. Scard, of the Welsh School of Architecture, The Technical College, Cardiff, who were awarded Scholarships of £50 each for the academical year 1934–1935, have been granted renewals of their Scholarships for the year 1935–1936.

The Scholarships are intended to foster the advanced study of construction and the improvement generally of constructional methods and materials and their influence on design.

## THE R.I.B.A. FINAL AND SPECIAL FINAL EXAMINATIONS

The following are the dates on which the forthcoming Examinations will be held:—

*Final Examination.*—4, 5, 6, 7, 9, 10 and 12 December 1935. (Last day for receiving applications, 4 November 1935.)

*Special Final Examination.*—4, 5, 6, 7, 9 and 10 December 1935. (Last day for receiving applications, 4 November 1935.)

### COUNCIL FOR THE PRESERVATION OF RURAL ENGLAND AND COUNCIL FOR THE PRESERVATION OF RURAL WALES

CHANGE OF ADDRESS

The offices of the above Councils have moved from 17 Great Marlborough Street, W.1, to 4 Hobart Place, S.W.1.

### ARCHITECTURAL EDUCATION IN S.E. ENGLAND

Lectures and courses in architecture are held at the following Schools of Art in S.E. England: The County School of Arts and Crafts, Worthing; the Hastings School of Art, and the School of Architecture, Canterbury. Prospectuses of the courses can be obtained from the Principals of the Schools or from the President of the South-Eastern Society of Architects, St. Moritz, The Upper Avenue, Eastbourne. The S.E. Society of Architects also runs a correspondence course of study for the examinations of the T.P.I.

### R.I.B.A. PROBATIONERS

During the month of August 1935 the following were enrolled as Probationers of the Royal Institute:—

BATES: HAROLD SELWYN, 12 Bedford Place, W.C.1.
CLARIDGE: BRYAN, "East View," Holymoorside, Chesterfield.
COULTEN: PERCY ROBERT, 62 Queen's Road, Bury St. Edmund's, Suffolk.
COX: FRANK, 245 St. Ann's Well Road, Nottingham.
DEMBITZER: MAX, 8 Molteno Road, Gardens, Capetown, South Africa.
GIFFARD: COLIN CARMICHAEL, Southcote, Castle Hill, Guildford.
KAINES: L. KLAY, 3 Llewellyn Mansions, Hammersmith Road, W.14.
KENNEDY: KENNETH, 109 King George Road, Harton, South Shields.
LARRINGTON: CLIFFORD TALBOT, 121 York Road, Woking, Surrey.
OWEN: HALSALL, Mydd1eton Hall, nr. Warrington, Lancs.
PACKER: DOUGLAS ARTHUR, "Pengwern," 23 Cunningham Park, Harrow.
PARSONS: WILLIAM JOHN, "Greengates," Alresford Road, Winchester.
PAXTON: DAVID RAYMOND PRYCE, 22 Alexandra Road, Stafford.
PEARSON: RONALD LOUIS, 31 Chestnut Grove, Acomb, York.
RAWES: DOUGLAS ALBERT, c/o A. S. G. Butler, Esq., 4 Francis Street, Westminster, S.W.1.
REED: ALAN, 31 Crescent Road, Upton Manor, London, E.13.
SISE: HAZEN EDWARD, 35 Bury Walk, S.W.3.
SYMES: GORDON SAMUEL, Clynderwen, Clapham Hill, Whitstable.
TRELEAVEN: REGINALD HENRY, 57 Woodland Gardens, Isleworth, Middlesex.
TURNBULL: ROBERT GEORGE HADDON, 4 Garden Street, Townhead, Glasgow, C.4.

# Notices

### THE INAUGURAL GENERAL MEETING, MONDAY, 4 NOVEMBER 1935, AT 8.30 P.M.

The Inaugural General Meeting of the Session 1935–1936 will be held on Monday, 4 November 1935, at 8.30 p.m., for the following purposes:—

To read the Minutes of the Tenth General Meeting of the Session 1934–35 held on Monday, 24 June 1935;

Mr. Percy E. Thomas, O.B.E., President, to deliver the Inaugural Address of the Session;

The President to unveil the portrait of Sir Giles Gilbert Scott, Hon. D.C.L., Hon. LL.D., R.A., Past-President, painted by Mr. R. G. Eves, A.R.A.

Evening Dress optional.

### ANNUAL SUBSCRIPTIONS

Members' subscriptions, Students' and Subscribers' contributions became due on 1 January 1935.

The amounts are as follows:—

| | |
|---|---|
| Fellows .. .. .. .. .. | £5 5 0 |
| Associates .. .. .. .. | £3 3 0 |
| Licentiates .. .. .. .. | £3 3 0 |
| Students .. .. .. .. .. | £1 1 0 |
| Subscribers .. .. .. .. | £1 1 0 |

NOTE.—By a resolution of the Council dated 20 July 1931, the subscriptions of R.I.B.A. members in the transoceanic Dominions who are also members of Allied Societies in those Dominions are reduced to the following amounts as from 1 January 1932:—

| | |
|---|---|
| Fellows .. .. .. .. .. | £3 3 0 |
| Associates .. .. .. .. | £2 2 0 |
| Licentiates .. .. .. .. | £2 2 0 |

### COMPOSITION OF SUBSCRIPTIONS FOR LIFE MEMBERSHIP

Fellows, Associates and Licentiates of the Royal Institute may become Life Members by compounding their respective annual subscriptions on the following basis:—

For a Fellow by a payment of £73 10s. (70 guineas).

For an Associate or Licentiate by a payment of £44 2s. (42 guineas), with a further payment of £29 8s. on being admitted as a Fellow.

In the case of members in the transoceanic Dominions who are members of allied societies in those Dominions, the following basis will operate:—

For a Fellow by a payment of £52 10s. (50 guineas).

For an Associate or Licentiate by a payment of £31 10s. (30 guineas), with a further payment of £21 (20 guineas) on being admitted as a Fellow.

Provided always that in the case of a Fellow or Associate the above compositions are to be reduced by £1 1s. per annum for every completed year of membership of the Royal Institute after the first five years, and in the case of a Licentiate by £1 1s. per annum for every completed year of membership of the Royal Institute, with a minimum composition of £6 6s. in the case of Fellows and £4 4s. in the case of Associates and Licentiates.

### NEW CLASSES OF RETIRED MEMBERS

Under the provisions of the revised Bye-law No. 15 applications may now be received from those members who are eligible for transfer to the class of "Retired Fellows," "Retired Associates," or "Retired Licentiates."

The revised Bye-law is as follows:—

"Any Fellow, Associate or Licentiate who has reached the age of fifty-five and has retired from practice may, subject to the approval of the Council, be transferred without election to the class of 'Retired Fellows,' 'Retired Associates,' or 'Retired Licentiates,' as the case may be, but in such case his interest in, or claim against the property of, the Royal Institute shall cease. The amount of the annual subscription payable by such 'Retired Fellow,' 'Retired Associate' or 'Retired Licentiate' shall be £1 1s. od., or such amount as may be determined by resolution of the Council, excepting in the case of those who have paid subscriptions as full members for thirty years, and who shall be exempt from further payment. A 'Retired Fellow,' 'Retired Associate,' or 'Retired Licentiate' shall have the right to use the affix of his class with the word 'Retired' after it, shall be entitled to receive the JOURNAL and *Kalendar*, shall be entitled

to the use of the Library, and shall have the right to attend General Meetings, but shall not be entitled to vote. A 'Retired Fellow,' 'Retired Associate' or 'Retired Licentiate' shall not engage in any avocation which in the opinion of the Council is inconsistent with that of architecture. Nothing contained in this Bye-law shall affect the rights of persons who at the date of the passing of this Bye-law are members of the classes of 'Retired Fellows' and 'Retired Members of the Society of Architects.'"

### REJECTION OF ARCHITECTS' DESIGNS BY LOCAL AUTHORITIES

Under the 1932 Town and Country Planning Act, Local Authorities have power to reject elevations which they consider are harmful to the amenities of the neighbourhood.

Many Local Authorities have consulted the Panel of Architects set up by the C.P.R.E. and the R.I.B.A. in connection with the elevations of buildings. There have been instances, however, where Councils, without a skilled Adviser, have rejected the plans of qualified Architects on æsthetic grounds.

Members of the Institute who have had plans rejected in this way are asked to notify the Secretary.

### THE RECEPTION OF NEW MEMBERS AND STUDENTS AT GENERAL MEETINGS

It has been decided by the Council to modify the procedure for the introduction and reception of new members and students at General Meetings. In future new members and students will be asked to notify the Secretary beforehand of the date of the General Meeting at which they desire to be introduced and a printed postcard will be sent to each newly elected member or student for this purpose. They will be asked to take their seats on arrival on a special bench or benches, reserved and marked for them. At the beginning of the meeting on the invitation being given to present themselves for formal admission each new member or student will be led up to the Chairman by one supporter, and the Chairman will formally admit them as members or students.

At the close of the meeting selected members of the Council will introduce themselves to the new members, and will make it their duty to introduce them to other members.

The introduction and reception of new members and students will take place at any of the Ordinary General Meetings of the Royal Institute with the exception of the meetings on the following dates:—

4 November 1935. (Inaugural General Meeting.)
27 January 1936. (Presentation of Medals and Prizes.)
6 April 1936. (Presentation of Royal Gold Medal.)

### BRITISH ARCHITECTS' CONFERENCE, SOUTHAMPTON, 24–27 JUNE 1936

The Annual Conference next year of the Royal Institute of British Architects and of its Allied and Associated Societies will take place at Southampton from 24 to 27 June 1936.

The Hampshire and Isle of Wight Architectural Association have in hand the preparation of a most attractive programme and particulars will be issued in due course.

### OVERSEAS APPOINTMENTS

When members are contemplating applying for appointments overseas they are recommended to communicate with the Secretary R.I.B.A., who will supply them with any available information respecting conditions of employment, cost of living, climatic conditions, etc.

# Competitions

The Council and Competitions Committee wish to remind members and members of Allied Societies that it is their duty to refuse to take part in competitions unless the conditions are in conformity with the R.I.B.A. Regulations for the Conduct of Architectural Competitions and have been approved by the Institute.

While, in the case of small limited private competitions, modifications of the R.I.B.A. Regulations may be approved, it is the duty of members who are asked to take part in a limited competition to notify the Secretary of the R.I.B.A. immediately, submitting particulars of the competition. This requirement now forms part of the Code of Professional Practice in which it is ruled that a formal invitation to two or more architects to prepare designs in competition for the same project is deemed a limited competition.

### BOLTON: NEW MUNICIPAL TECHNICAL COLLEGE

The Corporation of the County Borough of Bolton invite architects of British nationality to submit, in competition, designs for a new Municipal Technical College proposed to be erected in Manchester Road, Bolton.

Assessors: Mr. J. Bradshaw Gass [*F.*] and Mr. A. J. Hope [*F.*].
Premiums: £500, £250 and £100.
Last day for receiving designs: 31 October 1935.
Last day for questions: 17 August 1935.

Conditions of the competition may be obtained on application to Mr. John A. Cox, M.A., Director of Education, Education Offices, Bolton. Deposit £2 2s.

### BURY: NEW TOWN HALL

The Council of the County Borough of Bury invite architects of British nationality domiciled in the United Kingdom to submit, in competition, designs for a new Town Hall.

Assessor: Mr. J. Hubert Worthington, O.B.E. [*F.*].
Premiums: £500, £300 and £150.
Last day for receiving designs: 31 December 1935.
Last day for questions: 30 September 1935.

Conditions of the competition may be obtained on application to The Town Clerk, Municipal Offices, Bury, Lancs. Deposit £2.

### COATBRIDGE: PUBLIC BATHS AND PUBLIC HEALTH OFFICES

The Town Council of the Burgh of Coatbridge invite architects resident and practising in Scotland for a period of at least two years to submit in competition designs for Public Baths and Public Health Offices.

Assessor: Mr. Wm. B. Whitie [*F.*], President of the Royal Incorporation of Architects in Scotland.
Premiums: £250, £150 and £75.
Last day for receiving designs: 30 November 1935.
Last day for questions: 19 October 1935.

Conditions may be obtained on application to the Burgh Surveyor, Coatbridge. Deposit £2 2s.

### COLCHESTER: NEW PUBLIC LIBRARY

The Council of the Borough of Colchester invite registered architects who are members of the Essex, Cambridge and Hertfordshire Society of Architects and practise in those counties to submit, in competition, designs for a new Public Library.

Assessor: Professor A. E. Richardson, F.S.A. [*F.*].
Premiums: £150, £125, £75.
Last day for receiving designs: 30 November 1935.
Last day for questions: 5 October 1935.
Conditions of the competition may be obtained on application to Mr. R. L. H. Hiscott, Town Clerk, Town Hall, Colchester. Deposit £1.

### HARROW: NEW MUNICIPAL OFFICES

The Urban District Council of Harrow invite architects of British nationality to submit, in competition, designs for new Municipal Offices.
Assessors: Mr. C. H. James [*F.*] and Mr. S. Rowland Pierce [A.].
Premiums: £350, £250 and £150.
Last day for receiving designs: 24 January 1936.
Last day for questions: 4 November 1935.
Conditions of the competition may be obtained on application to Mr. Vernon Younger, Clerk of the Council, Council Offices, Stanmore, Middlesex. Deposit £2 2s.

### PORTSMOUTH: DEVELOPMENT OF LUMPS FORT SITE

The latest date for the submission of designs in the above Competition has been extended to 16 November 1935

### SALISBURY, SOUTHERN RHODESIA: NEW PARLIAMENT HOUSE

The Government of the Colony of Southern Rhodesia invite architects of British citizenship to submit, in competition, designs for a new Parliament House to be erected at Salisbury, Southern Rhodesia.
Assessor: Mr. James R. Adamson [*F.*].
Premiums: £500, £300, £200 and £100.
Last day for receiving designs: 31 January 1936.
Last day for questions: 26 August 1935.
Conditions of the competition may be obtained :—
(*a*) in England from the High Commissioner for Southern Rhodesia, Crown House, Aldwych, London, W.C.2.
(*b*) in South Africa from The Director of Public Works, P.O. Box 365, Salisbury, Southern Rhodesia. Deposit £2 2s.

### YORK: NEW MUNICIPAL OFFICES, CLINICS, ETC.

The Corporation of York invite architects of British nationality and domiciled in the United Kingdom to submit, in competition, designs for new Municipal Offices, Clinics, etc.
Assessor: Mr. Henry V. Ashley [*F.*].
Premiums: £250, £150, £100 and £50.
Last day for receiving designs: 1 November 1935.
Last day for questions: 29 July 1935.

### COMPETITION FOR TIMBER HOUSES

The Timber Development Association, Ltd., invite architects of British nationality to submit, in competition, designs for:
(1) A Timber House to cost £800.
(2) A Timber Week-end Cottage to cost £350.
Assessors: Mr. Robert Atkinson [*F.*].
Mr. E. Maxwell Fry [*A.*].
Mr. G. Grey Wornum [*F.*].
Premiums: £100, £30 and £25 in each section.
Last day for receiving designs: 28 October 1935.
Conditions of the competition may be obtained on application to the Manager, Timber Development Association, Ltd., 69–73 Cannon Street, E.C.4.

### *COMPETITION RESULT*

### SWINDON: NEW MUNICIPAL OFFICES

1. Messrs. S. N. Bertram [*A.*], E. M. Bertram [*A.*] and E. M. Rice [*A.*] (Oxford).
2. Messrs. H. W. Cruickshank [*F.*] and H. T. Seward [*F.*] (Manchester).
3. Mr. Duncan Wylson (Student) (London).

# Members' Column

### VACANCIES FOR ARCHITECTURAL ASSISTANTS

ARCHITECTURAL Assistant, to be suitably qualified, preference being given to candidates with accepted professional qualifications and training in architectural design and draughtsmanship. Salary £325, rising by annual increments, subject to satisfactory service, of £12 10s. to £350 per annum.

ARCHITECTURAL Assistant, Junior, to be suitably qualified, preference being given to candidates with training in architectural draughtsmanship. Salary £110 per annum, rising by annual increments, subject to satisfactory service, of £12 10s. to £240 per annum. The commencing salary to be fixed according to candidate's age and experience.

Forms of application for the above two vacancies may be obtained upon application, enclosing stamped addressed foolscap envelope, to Mr. F. Willey, F.R.I.B.A., 34 Old Elvet, Durham. Last day for receiving applications, 28 October 1935.

### POSITION WANTED

F.R.I.B.A., many years' experience Africa, France and England. Practical draughtsman, wide knowledge construction and supervision, office organisation and administration and furniture, furnishing and decoration, seeks employment with architect at home or abroad. Salary by arrangement.—Apply Box No. 2105, c/o Secretary R.I.B.A.

### PARTNER WANTED

A.R.I.B.A. desires an experienced partner for a general practice near Birmingham; exceptional opportunity to capable man. Full particulars, which will be treated in confidence, to Box No. 1995, c/o Secretary R.I.B.A.

### COUNTRY PRACTICE

MEMBER having well-established practice in small but growing coast resort in S.W. county wishes to hand over gradually to younger man who can support himself by independent means during the first two years. Income from practice small, but development promising and living conditions pleasant. No capital payment required. Particulars to Box No. 6105, c/o Secretary R.I.B.A.

### PARTNERSHIPS WANTED

L.R.I.B.A., Practising Quantity Surveyor, with over 30 years' provincial experience, seeks co-operation with architect on working agreement or partnership basis. Trained originally as architect's assistant, retained facility in draughtsmanship, could render valuable help in preparation of working drawings, matters of construction and dealing with business side of a practice. Reputation and references for accurate and conscientious work done for architects well known in the Wessex and South Wales district of the Institute. Box No. 4105, c/o Secretary R.I.B.A.

FELLOW, 42 years of age, home on leave from Far East, seeks partnership in England. Capital available. Has very wide experience and is hard worker. Reply Box No. 9435, c/o Secretary R.I.B.A.

### PRACTICE WANTED

MEMBER wishes to purchase small well-established provincial practice. Full particulars to Box No. 1285, c/o Secretary R.I.B.A.

### SHARE IN OFFICE WANTED

FELLOW, age 38, employing one assistant, would like to share office in London with member in established practice, with a view to collaborating or rendering mutual assistance when necessary. Box No. 8105, c/o Secretary R.I.B.A.

### FUTURE PARTNERSHIP

LONDON ARCHITECT [*F.*] with interesting small practice (chiefly domestic and church work, etc.) wishing to "ease off" gradually, desires to meet an enthusiastic young architect either in practice or having an assured connection, with a view to partnership in due course. Terms may be based upon reciprocal services in lieu of premium. Full particulars to Box No. 5105, c/o Secretary R.I.B.A.

### USE OF GROUND FLOOR OFFICE

FELLOW with attractive ground floor office in W.C. district offers accommodation address and part use to another practitioner, including telephone, clerical services, etc. Box No. 2595, c/o Secretary R.I.B.A.

### ROOM TO LET

TO BE LET, Bedford Row district, good room, 14 ft. by 13 ft., with drawing table and use of telephone. £40 p.a. Part use of general office £20 p.a. additional. Box No. 7105, c/o Secretary R.I.B.A.

### NEW FIRM

IN the issue of 7 September the title of the firm of Messrs. Wylie, Shanks and Wylie [*A.A.A.*] was wrongly given as Messrs. Wylie, Wylie and Shanks. Messrs. Wylie, Shanks and Wylie have taken over the business of the firm Messrs. Wylie, Wright and Wylie, and are continuing to practise at 204 West Regent Street, Glasgow.

### TRADE CATALOGUES WANTED

MR. F. VAN BAARS [*L.*], 67 and 69 Chancery Lane, London, W.C.2, will be pleased to receive trade catalogues.

### CHANGES OF ADDRESS

Mr. W. DALTON IRONSIDE [*A.*] has changed his address to Tenyngs Hoek, Hoe, Gomshall, Surrey, and all communications and trade catalogues should be sent to him at that address.

MR. REGINALD LONE [*A.*] has changed his office address to 15 New Square, Lincoln's Inn, W.C.2. (Tel.: Hol. 1795.)

MR. C. R. MILLINGTON [*A.*] has changed his address to 203 Croxted Road, West Dulwich, S.E.21.

MR. ARTHUR T. W. GOLDSMITH [*L.*] has changed his address to 13 Liverpool Gardens, Worthing. His telephone number remains the same.

MR. FRANK ROSCOE [*A.*] has removed from Chelsea to 1 Thornhaugh Street, Russell Square, W.C.1, where he has also opened a new office. Telephone: Museum 7860.

MR. W. GEOFFREY PLANT, Dip.Arch. [*A.*], has changed his address to "Danum," Hill Barton, Whipton, Exeter.

MR. E. A. L. MARTYN [*F.*] has moved to other offices at 100 Easton Street, High Wycombe, to which address all further communications should be addressed. Telephone: High Wycombe 378.

MESSRS. T. P. BENNETT AND SON have changed their address to 43 Bloomsbury Square, London, W.C.1. Telephone: Holborn 9804 (4 lines).

# Architects' and Surveyors' Approved Society

ARCHITECTS' ASSISTANTS' INSURANCE FOR THE NATIONAL HEALTH AND PENSIONS ACTS

Architects' Assistants are advised to apply for the prospectus of the Architects' and Surveyors' Approved Society, which may be obtained from the Secretary of the Society, 26 Buckingham Gate, London, S.W.1.

The Society deals with questions of insurability for the National Health and Pensions Acts (for England) under which, in general, those employed at remuneration not exceeding £250 per annum are compulsorily insurable.

In addition to the usual sickness, disablement and maternity benefits, the Society makes grants towards the cost of dental or optical treatment (including provision of spectacles).

No membership fee is payable beyond the normal Health and Pensions Insurance contribution.

The R.I.B.A. has representatives on the Committee of Management, and insured Assistants joining the Society can rely on prompt and sympathetic settlement of claims.

# A.B.S. Insurance Department

PENSION AND FAMILY PROVISION SCHEME FOR ARCHITECTS

This scheme has been formulated by the Insurance Committee of the Architects' Benevolent Society and is available to all members of the R.I.B.A. and its Allied and Associated Societies.

The benefits under the scheme include:—

(1) A Member's Pension, which may be effected for units of £50 per annum, payable monthly and commencing on attainment of the anniversary of entry nearest to age 65. This pension is guaranteed over a minimum period of five years and payable thereafter for the remainder of life.

(2) The Beneficiary's Pension, payable as from the anniversary mentioned in Benefit No. 1, but to the widow (or other nominated beneficiary) if the member dies before age 65. The amount of this pension is adjusted in accordance with the disparity between the ages of the member and his wife.

(3) Family Provision. Under this benefit a payment of £50 yearly is made to the dependent from the date of death of the member prior to age 65 until attainment of the anniversary previously mentioned, after which benefit No. 2 becomes available.

Provision can be made for any number of units (of £50 per annum) up to a maximum of £500 per annum.

Pension benefit only may be secured if desired and the pension commuted for a cash sum.

Members are entitled to claim rebate of Income Tax on their periodical contributions to the scheme both in respect of pension and of family provision benefit.

Full particulars of the scheme will be sent on application to the Secretary, A.B.S. Insurance Department, 66 Portland Place, W.1.

It is desired to point out that the opinions of writers of articles and letters which appear in the R.I.B.A. JOURNAL must be taken as the individual opinions of their authors and not as representative expressions of the Institute.

Members sending remittances by postal order for subscriptions or Institute publications are warned of the necessity of complying with Post Office Regulations with regard to this method of payment. Postal orders should be made payable to the Secretary R.I.B.A., and crossed.

R.I.B.A. JOURNAL

DATES OF PUBLICATION.—1935.—9, 23 November; 7, 21 December. 1936.—4, 18 January; 8, 22 February; 7, 21 March; 4, 25 April; 9, 23 May; 6, 27 June; 18 July; 8 August; 5 September; 17 October.